



Mojave Desert
Air Quality Management District

Final
**Attainment Demonstration,
Maintenance Plan,
and
Redesignation Request**

for the
Trona Portion
of the
Searles Valley PM₁₀ Nonattainment Area

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TABLE OF CONTENTS

EXECUTIVE SUMMARY	SUM - 1
Chapter 1 - Introduction and Background.....	1
Purpose	2
Regulatory History	2
Setting.....	4
Part One - Attainment Demonstration.....	6
Chapter 2 - Ambient Data and Emission Reductions	7
Ambient PM ₁₀ Data	8
Emission Reductions.....	10
Chapter 3 - Rollback Model	14
Linear Rollback Model	15
Comparison with 1991 Analysis.....	15
Part Two - Maintenance Plan.....	17
Chapter 4 - Regional Forecast	18
Forecasted Emission Inventory	19
Growth Codes	19
General Emission Inventory	19
Linear Rollback Model Forecast	21
Chapter 5 - Control Measures	23
Additional Measures	24
Contingency Measures.....	24
Part Three - Redesignation Request.....	25

Chapter 6 - Requirements	26
Redesignation.....	27
Requirements.....	27
Appendix A - Air Quality Data	A - 1
Appendix B - Emission Inventories	B - 1
Appendix C - Implementation Documentation	C - 1

FIGURES and TABLES

Figure One USEPA Region IX Federal PM ₁₀ Nonattainment Areas	3
Figure Two Trona Portion of Searles Valley Federal PM ₁₀ Nonattainment Area	5
Figure Three MDAQMD Station PM ₁₀ Concentrations	9
Figure Four Annual Arithmetic Averages.....	9
Table One Control Measure Summary.....	12
Table Two Control Measure Emission Reduction Summary	13
Table Three Rollback Attainment Demonstration	16
Figure Five Trona Region PM ₁₀ Emission Inventory Trend	21
Table Four Linear Rollback Forecast.....	22

ABBREVIATIONS and ACRONYMS

Ace	Ace Cogeneration Company
APCD	Air Pollution Control District
AQMD	Air Quality Management District
BLM	Bureau of Land Management
CARB	California Air Resources Board
DCP	Dust Control Plan
FCAA	Federal Clean Air Act
MDAQMD	Mojave Desert Air Quality Management District

NAAQS	National Ambient Air Quality Standard
NACC	North American Chemical Company
PM ₁₀	Respirable Particulate Matter
RACM	Reasonably Available Control Measures
SIP	State Implementation Plan
SLAMS	State and Local Air Monitoring System
SVPA	Searles Valley Planning Area
USEPA	United States Environmental Protection Agency

EXECUTIVE SUMMARY

The United States Environmental Protection Agency (USEPA) designated the Searles Valley a nonattainment area for the PM₁₀ National Ambient Air Quality Standards (NAAQS) with the 1990 amendments to the Federal Clean Air Act (FCAA). The nonattainment designation required the adoption of a PM₁₀ attainment plan for the region, which identifies how the Searles Valley will attain the PM₁₀ NAAQS by the end of 1994. The Mojave Desert Air Quality Management District (MDAQMD) adopted the 'PM₁₀ State Implementation Plan for the Searles Valley Planning Area' in November 1991 to satisfy this requirement. Rule 403.1 - *Fugitive Dust Control for the Searles Valley Planning Area* was adopted on June 22, 1994 to implement the Reasonably Available Control Measures (RACM) identified in the attainment plan.

Due to the implementation of all control measures identified in the Searles Valley PM₁₀ Plan, along with voluntary actions taken by local industry to reduce dust emissions, the San Bernardino County portion of the Searles Valley Federal PM₁₀ Nonattainment Area has attained the annual and 24-hour PM₁₀ NAAQS. No exceedances of the PM₁₀ NAAQS have been monitored in the area since December 19, 1990. All available PM₁₀ monitoring data have been accumulated to verify the air quality improvement. The collected data reveals a dramatic improvement in air quality corresponding with the implementation of control measures. In addition, a linear rollback model has been employed to demonstrate that the emission reductions obtained in the area are consistent with attainment of the PM₁₀ NAAQS under worst-case conditions.

A forecasted emission inventory has been prepared for the area, using local industries' and regional planning entities' estimates of future activity. This forecasted inventory has also been analyzed with a linear rollback model to estimate future ambient PM₁₀ concentrations. This analysis has shown that ambient concentrations will not exceed 132 µg/m³ through the year 2010. No additional control measures or contingency measures beyond those already in place for the area will be required to maintain attainment of the PM₁₀ NAAQS through the year 2010. The forecasted inventory and linear rollback analysis form a maintenance plan for the region, a requirement for the region to be redesignated to attainment.

Approval of the collected data, findings and forecasts presented in this document will provide the United States Environmental Protection Agency with all of the elements required by the Federal Clean Air Act to redesignate the San Bernardino County portion of the Searles Valley Federal PM₁₀ nonattainment area to attainment of the PM₁₀ NAAQS.

This document is organized into an introduction and three parts, with appendices. Part One presents an attainment demonstration, and includes Chapter 2 describing ambient data and emission reductions, and Chapter 3 describing the linear rollback model used to understand the relationship between emissions and ambient concentrations. Part Two presents a maintenance plan, and includes Chapter 4 describing the regional forecast in terms of expected emissions and concentrations, and Chapter 5 describing control measure needs. Part Three presents a redesignation request, and includes Chapter 6 discussing the statutory requirements for a redesignation request. Appendix A presents a complete ambient PM₁₀ concentration record for

the area. Appendix B presents a complete emission inventory for the area, including a forecast through the year 2010. Appendix C presents documentation of control measure implementation in the area.

CHAPTER 1

Introduction and Background

Purpose

Regulatory Background

Setting

INTRODUCTION

Purpose

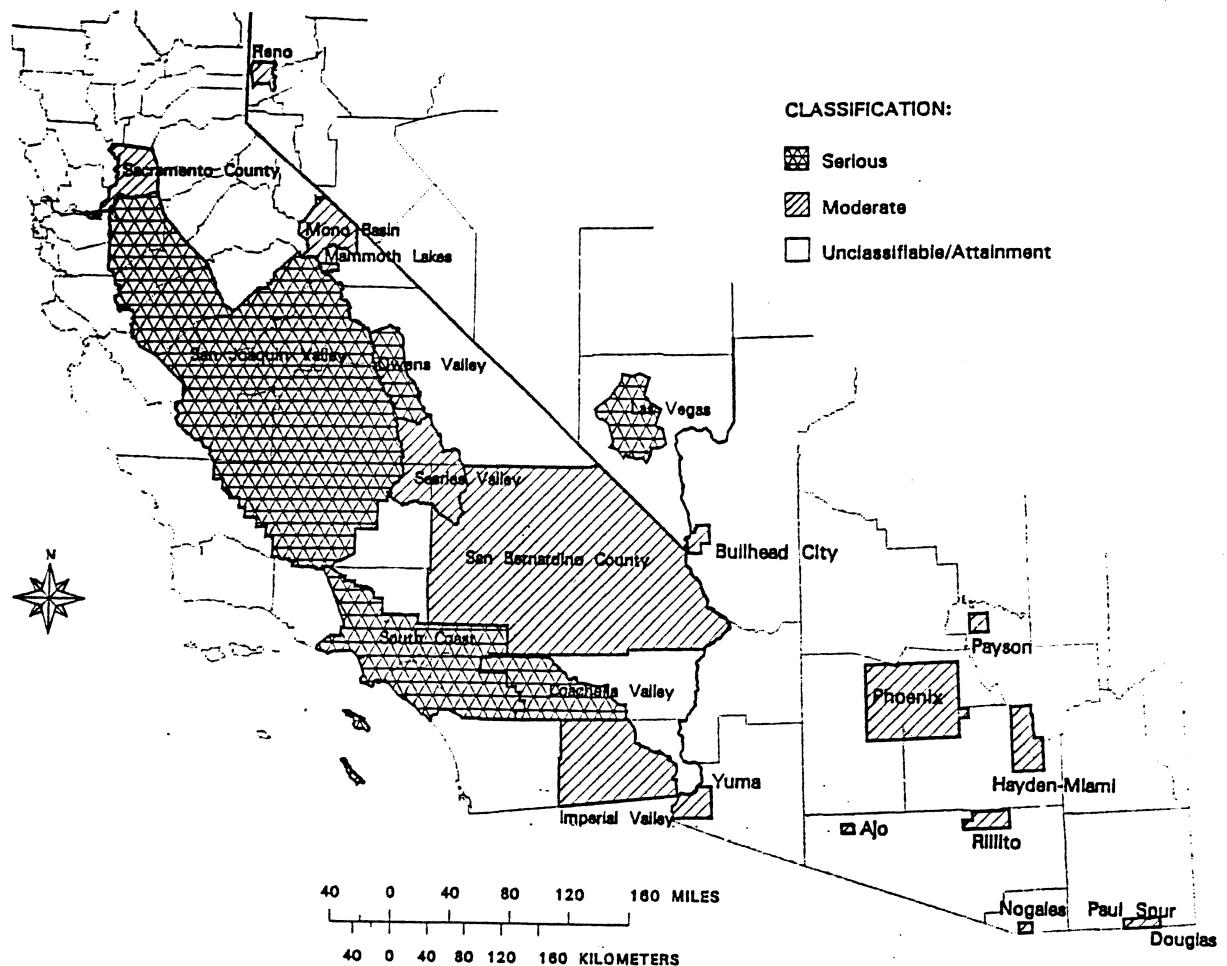
The Trona portion of the Searles Valley federal PM₁₀ nonattainment area has not experienced an exceedance of any Federal PM₁₀ National Ambient Air Quality Standard (NAAQS) since December 19, 1990. This document: (1) demonstrates that this air quality improvement is due to the successful implementation of the PM₁₀ control strategy contained in the region's State Implementation Plan (SIP); (2) demonstrates that the significant PM₁₀ emission reductions generated in the region are permanent and enforceable; and (3) contains a maintenance plan to ensure that the region will not experience any exceedances through the year 2010. This document concludes by requesting a redesignation of the Trona portion of the Searles Valley federal PM₁₀ nonattainment area from 'nonattainment' to 'attainment' for the PM₁₀ NAAQS. Furthermore, this document satisfies 42 U.S.C. §§7407(d)(3), 7505a, and 7513a(c)(2) (Federal Clean Air Act (FCAA) §§107(d)(3), 175A, and 189(c)(2)) regarding milestone information, maintenance plan contents and redesignation requests.

Regulatory History

USEPA identified the Searles Valley as a high PM₁₀ concentration area by listing it in the Federal Register (52 FR 29383 August 7, 1987) as a Group I PM₁₀ area. 42 U.S.C. §7407(d)(4)(B) (FCAA 107(d)(4)(B)) designated the Searles Valley a nonattainment area for the PM₁₀ NAAQS as of November 15, 1990 (see Figure One). This designation was based on many PM₁₀ NAAQS exceedances monitored after 1985 at the official Trona monitoring site and several industry-operated monitoring sites. The three air districts with jurisdiction over the Searles Valley (Mojave Desert AQMD (then the San Bernardino County APCD), Great Basin Unified APCD, and Kern County APCD) then prepared a PM₁₀ attainment plan for the region and adopted it on November 25, 1991. This document was not acted on by the United States Environmental Protection Agency (USEPA).

The Mojave Desert Air Quality Management District (MDAQMD) prepared an amendment to the region's PM₁₀ attainment plan to improve the emission inventory and identify specific control measures for the Trona portion of the nonattainment area. This amendment was adopted on September 22, 1993. On June 22, 1994 the MDAQMD promulgated a rule (MDAQMD Rule 403.1 - *Respirable Particulate Matter*) to implement the control measures identified in the amendment to the attainment plan.

Figure One
USEPA Region IX Federal PM₁₀ Nonattainment Areas



On August 2, 1994, USEPA and the California Air Resources Board (CARB) notified MDAQMD that they had determined that the amended attainment plan had insufficient contingency measures. On June 28, 1995 the MDAQMD adopted a revised attainment plan for the Trona portion of the nonattainment area that included improved contingency measures and the September 1993 amendment. MDAQMD Rule 403.1 was also revised to incorporate the contingency measures and was adopted on July 31, 1995 (MDAQMD Rule 403.1 - *Fugitive Dust Control for the Searles Valley Planning Area*). On October 13, 1995 CARB forwarded Rule 403.1 to USEPA for approval and subsequent inclusion into the SIP. USEPA has not yet acted on Rule 403.1 because, as of this date, CARB has not forwarded to USEPA the revised attainment plan.

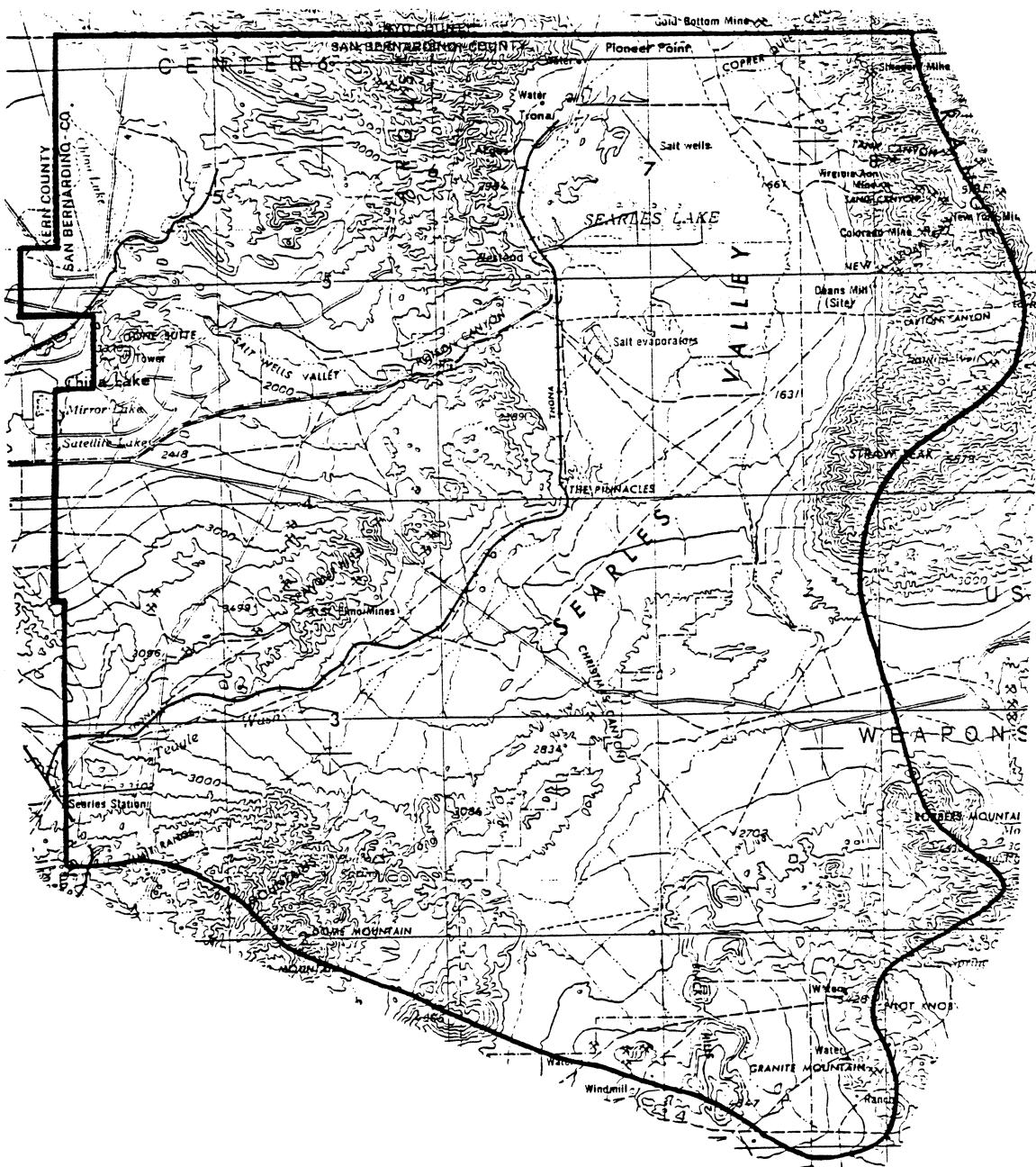
Setting

The Trona portion of the Searles Valley Federal PM₁₀ nonattainment area is that portion of the Searles Valley Federal PM₁₀ nonattainment area that falls within San Bernardino County (see Figure Two). The area covers approximately 575 square miles and included 3,431 persons as of the 1990 census. The area is characterized by arid hills and mountains, and two dry lakes: China Lake and Searles Lake. China Lake averages four inches of precipitation per year. The area features two significant communities, Trona and the nearby Pioneer Point, and several reference communities, including Argus and Westend. A portion of the China Lake Naval Weapons Center main facility and south range are located in the area.

The primary roadways in the area are State Route 178 and Trona Road, both of which intersect Highway 395. Both of these arterials carry a substantial amount of through traffic to Death Valley National Park. The area also covers the majority of the Spangler Hills Off Highway Vehicle Area, a dedicated off-road vehicle use area managed by the Bureau of Land Management (BLM). Trona is the terminus of the Trona Railway, a 30 mile private spur from the Southern Pacific line.

The area is dominated by the industrial activities involving the Searles Lake brine deposits. At present these operations are run by North American Chemical Company (NACC), which operates significant facilities at Trona, Argus, Westend, and on the dry lake itself. Another significant industrial source is Ace Cogeneration Company, which operates a large coal-fired boiler that generates electricity for sale to Southern California Edison and supplies steam to NACC.

Figure Two
Trona Portion of Searles Valley Federal PM₁₀ Nonattainment Area
(Southern and eastern boundary is coterminous with Hydrological Unit Number 18090205)



Part One

Attainment Demonstration

Chapter 2

Ambient Data and Emission Reductions

Ambient PM₁₀ Data

Emission Reductions

Ambient PM₁₀ Data

Ambient PM₁₀ concentrations have been monitored in Trona since 1985. Prior to 1985 total suspended particulate data was gathered in the region. During this period MDAQMD and its predecessor (San Bernardino County APCD) have monitored PM₁₀ at two different sites, Market Street (through February of 1994) and Athol Street (beginning January 1993). These MDAQMD-maintained sites are certified by CARB, and part of the State and Local Air Monitoring System network.

PM₁₀ has also been monitored at several NACC-maintained sites: ACE-1 above Argus; ACE-2 in Argus; ACE-3 just north of Trona; ACE-5 south of Searles Lake at the Pinnacles; and ACE-6 north of the region just over the Inyo County boundary (please refer to Figure Two). These monitoring sites were established as part of the Searles Valley Air Quality Study (SVAQS), which stopped gathering data in 1991. However, NACC has continued to operate one of the sites, ACE-3, through the present.

At each PM₁₀ monitoring site, concentration data is gathered by a Graseby-Andersen high-volume sampler drawing ambient air through a selective size inlet and a quartz fiber filter. Each sampler operates for 24 hours on the same six day cycle. Several of the ACE sites operated on a daily basis during the 1980s.

A graphic representation of the MDAQMD station data is given in Figure Three (the complete ambient PM₁₀ monitoring record for the Trona region is presented in Appendix A). As Figure Three displays, monitored ambient PM₁₀ concentrations have not exceeded the 24-hour PM₁₀ NAAQS since April 23, 1990 (an exceedance of 228 µg/m³ was measured at ACE-3 on December 19, 1990). Figure Four presents annual arithmetic averages for all of the monitoring data (note that several averages do not represent complete annual data sets). Annual arithmetic average PM₁₀ concentrations have not exceeded the annual PM₁₀ NAAQS since 1985. The federal PM₁₀ NAAQS are: 150 µg/m³ over a 24-hour average and 50 µg/m³ for an annual arithmetic mean.

Figure Three
MDAQMD Station PM₁₀ Concentrations

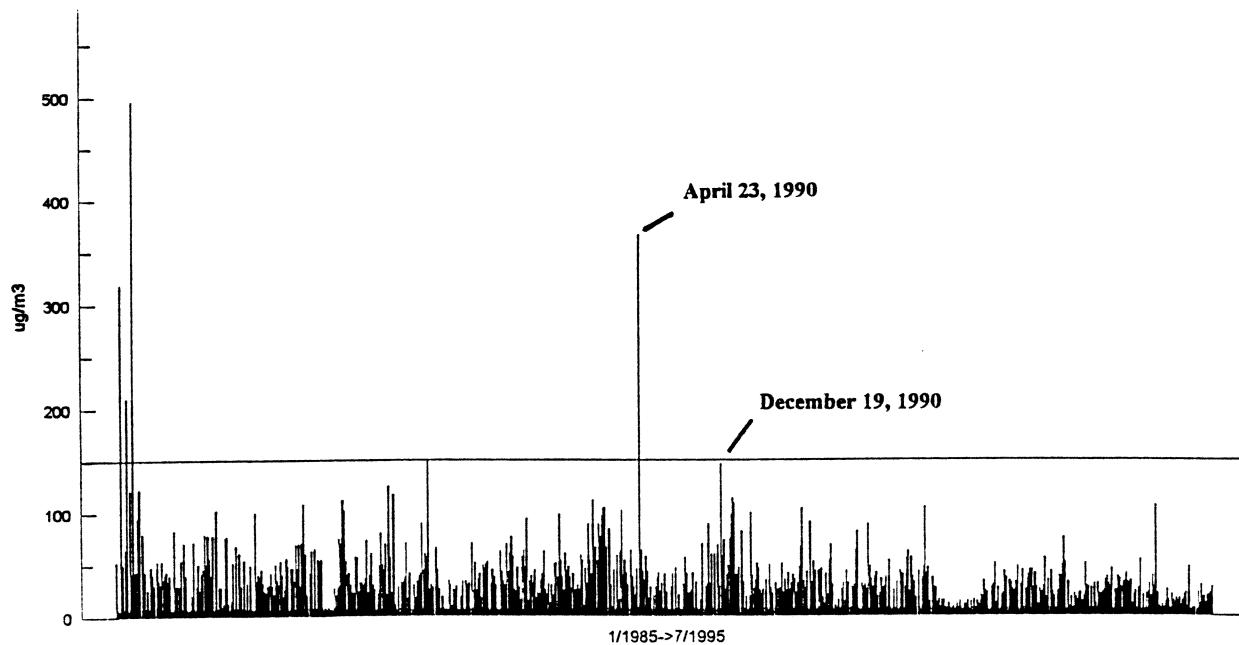
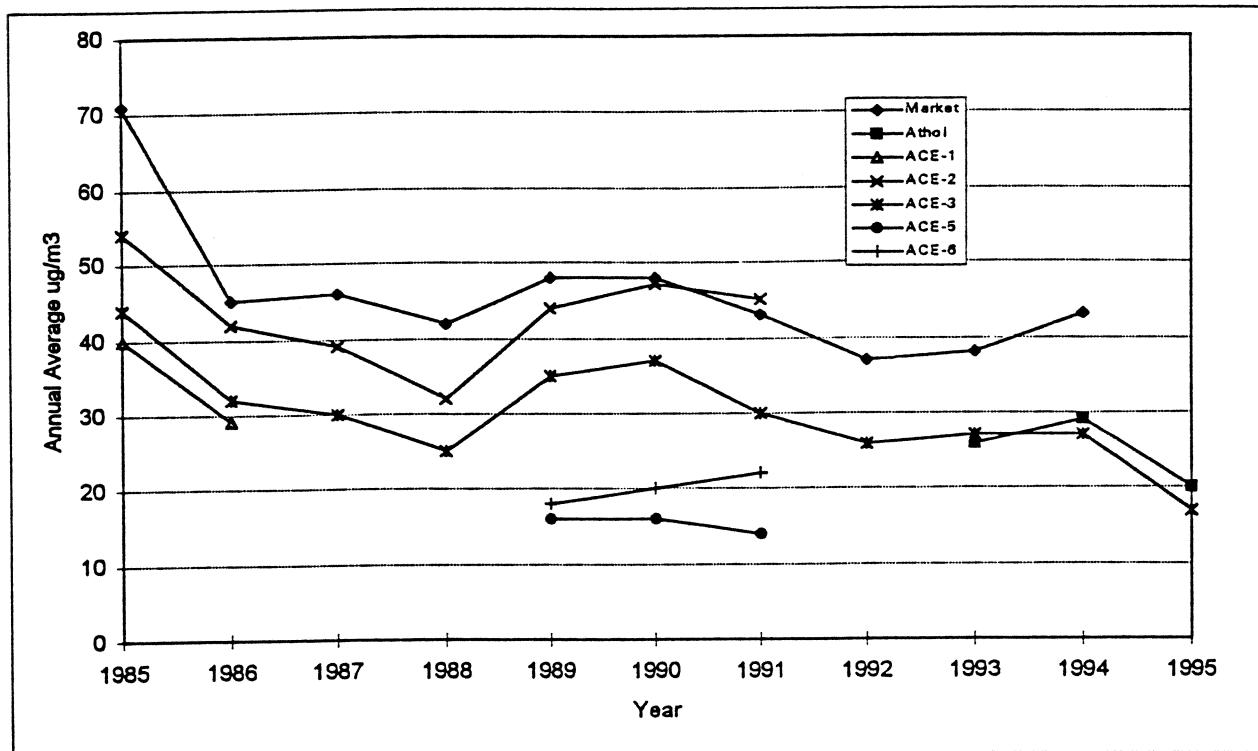


Figure Four
Annual Arithmetic Averages (All Data)



Emission Reductions

The Searles Valley PM₁₀ Plan selected several control measures for implementation within the Trona region to generate PM₁₀ emission reductions sufficient to bring the region into attainment of the PM₁₀ NAAQS. These control measure have been implemented through a combination of MDAQMD rule promulgation and actions by the MDAQMD, BLM, NACC, and Ace. Chapter Four of the Searles Valley PM₁₀ Plan identified five control measure groups: Industrial Fugitives, Construction/Demolition, Public Unpaved Road Dust, Industrial Roads, and Public Disturbed Areas.

Control measures within the Industrial Fugitive, Construction/Demolition, Public Unpaved Road Dust, and Industrial Road groups have been implemented and enforced via MDAQMD Rule 403.1 - *Fugitive Dust Control for the SVPA*. MDAQMD Rule 403.1 was first adopted on June 22, 1994 as Rule 403.1 - *Respirable Particulate Matter*, and was amended and renamed on July 31, 1995.

Sections (C)(2)(a) and (b) of Rule 403.1 require treatment of eight miles of industrial road on Searles Lake with salt and weekly brackish watering of an additional 12 miles of Searles Lake road. NACC has paved at least 12 miles of Searles Lake road with salt, and waters with brackish water on a weekly basis at least 20 miles of Searles Lake road.

Sections (C)(2)(c) and (d), and Section (C)(4)(d) of Rule 403.1 require biweekly removal of industrial spilled materials from paved roads, maintenance of a minimum road surface silt loading on industrial roads, and maintenance of a minimum road surface silt loading on paved surfaces adjacent to industrial unpaved roads. NACC instituted a plant-wide street sweeping program (sweeping at least two days a week) in June, 1994. Ace Cogeneration instituted a regular fly ash and bottom ash storage silo area sweeping program in July, 1994. Sample street sweeping and ash cleanup logs are included in Appendix C.

Section (C)(3) of Rule 403.1 requires a Dust Control Plan (DCP) to be prepared and followed for each construction/demolition source or project. A DCP has been prepared by each major facility in the area (NACC, Ace Cogeneration and China Lake). These DCPs apply to all projects on each facility. No other construction/demolition projects of note have occurred in the area, so no other DCPs have been required. Approved DCPs are included in Appendix C.

Section (C)(4)(a) of Rule 403.1 requires industrial sources to enclose exterior transfer lines greater than thirty feet in length. NACC covered two conveyors in February, 1994. No uncovered conveyors exist in the area.

Section (C)(4)(b) of Rule 403.1 requires the elimination of at least 2750 square feet of storage pile area by industry. Since January, 1994, NACC has eliminated 115,000 tons of open storage piles (covering approximately 4,125,000 square feet).

Section (C)(4)(c) of Rule 403.1 requires industrial haul trucks to be covered while operating on paved roads. All industrial haul trucks have been covered while operating on public paved roads since adoption of Rule 403.1.

Section (C)(5) of Rule 403.1 a dust control plan to be prepared by MDAQMD and BLM. BLM submitted a commitment letter (October 6, 1994) to fulfill the requirement. The commitment letter is included in Appendix C.

The Public Disturbed Area control measure has been implemented by the MDAQMD via contracted soil treatment activities. Initial soil treatment occurred on September 31, 1995. The stabilization report is included in Appendix C.

Table One presents a summary of the control measures and their implementation status. Table Two presents a summary of the emission reductions generated by each control measure, compared to the expected emission reductions for each control measure.

Table One
Control Measure Summary

Control Measure	Implementation Notes
Via MDAQMD Rule 403.1, adopted 6/22/94 and amended 7/31/95:	
<i>Industrial Fugitives</i>	
Enclose Process Lines	No action required yet
Lower Bulk Material Storage Piles	Significant NACC piles have been removed in 1994 and 1995
Cover Bulk Material Haul Trucks	Trucks were covered as of date of adoption
Rapidly Clean Up Bulk Material Spills	NACC street sweeping program and Ace sweeping since mid 1994
Pave Unpaved Road Access Points	Salt paving of Searles Lake unpaved roads has been ongoing since 1991
Rapidly Clean Up Track-in	NACC street sweeping program have been operating since late 1994
<i>Construction/Demolition</i>	
Require Dust Control Plans (DCPs)	DCPs have been submitted and approved for NACC, Ace and China Lake
Maintain Natural Topography	No action required yet
Construct Pavement First	No action required yet
Construct Upwind First	No action required yet
Cover Haul Trucks	Trucks have been covered since date of adoption
<i>Public Unpaved Road Dust (MOU with BLM)</i>	
Pave Unpaved Road Access Points	Letter of intent received from BLM
Develop Traffic Reduction Plans	Letter of intent received from BLM
Limit Use of Recreational Vehicles	Letter of intent received from BLM
Stabilize Disturbed Areas	Letter of intent received from BLM
<i>Industrial Roads</i>	
Stabilize Heavily Traveled Unpaved Roads	Salt paving of Searles Lake unpaved roads has been ongoing since 1991
Via MDAQMD action, beginning 9/30/95:	
<i>Public Disturbed Areas</i>	
Stabilization of Disturbed Areas	Stabilization using 'Soil-Sement' of approximately five acres was performed on 9/30/95

Table Two
Control Measure Emission Reduction Summary

Control Measure	Expected Reductions ¹	Realized Reductions (1994) ²	Percentage of Expected ³
Industrial Fugitives	0.11 tpd (20%)	0.16 tpd (34%)	170%
Construction/Demolition	0.13 (20%)	0.03 (20%)	100%
Public Unpaved Road Dust	0.15 (20%)	0.05 (20%)	100%
Industrial Roads	1.66 (40%)	3.26 (53%)	133%
Public Disturbed Areas	0.96 (28%)	0.00 (0%)	0%
Totals: ⁴	3.01 (25%)	3.50 (35%)	140%

Notes:

1. *Expected and realized emission reductions are also given in parenthesis and represent percentage of unreduced emission category.*
2. *'Realized Reduction' values differ from 'Expected Reductions' due to differences in emission inventory estimation methodologies. For example, Construction/Demolition reductions were expected to be 0.13 tpd, but were realized as 0.03 tpd. In terms of percentage they are equivalent because the emission inventory methodology changed and resulted in a lower base or uncontrolled value.*
3. *'Percentage of Expected' describes the ratio of realized over expected reduction percentages, not gross values.*
4. *Parenthetical values are percentage of 1990 emission inventory.*

Chapter 3

Rollback Model

Linear Rollback Model

Comparison with 1991 Analysis

Linear Rollback Model

The 1991 Searles Valley PM₁₀ Attainment Plan identified several control measures to generate PM₁₀ emission reductions in the Trona region. These measures have been implemented voluntarily in the region, and are being enforced through MDAQMD Rule 403.1 - *Fugitive Dust Control for the SVPA*. The effect of these measures on PM₁₀ concentrations can be estimated through the use of the linear rollback model.

The linear rollback model establishes a direct relationship between emissions and ambient concentrations. The model does this by assuming that concentrations measured on a ‘design day’ are the direct result of emissions generated on that ‘design day.’ The ‘design day’ is, by convention, the day with the highest ambient concentration that can be determined to be the result of local effects. This also means the design day is a worst case day. In the Trona region, December 19, 1990 was selected as the design day, and the ACE-3 concentration of 228 µg/m³ was used as the design value. April 23, 1990 had a higher concentration at Market Street but the exceedance was determined to be the result of exceptional conditions (high winds). By establishing a relationship between emissions and concentrations on the design day, the rollback model can convert emission reductions into concentration reductions (or the reverse, as appropriate).

Table Three presents the rollback model for the Trona region, including actual 1990 and projected controlled 1994 emissions and concentrations as estimated in the 1991 attainment plan, and actual 1990 and actual controlled 1994 emissions and concentrations as estimated today. The right-most column shows that the emission reductions realized in the Trona region in 1994 have resulted in an emission level consistent with an ambient concentration of 136 µg/m³ under worst case conditions similar to those experienced on the design day. This worst-case ambient concentration is in attainment of the PM₁₀ NAAQS.

Comparison with 1991 Analysis

The 1991 Searles Valley Attainment Plan and 1995 Searles Valley PM₁₀ Plan included linear rollback analyses. There are differences between the emission inventory and rollback demonstration presented here and in the Searles Valley attainment plans.

Background and transport have been estimated for the present analysis through the use of the lowest monitored ambient concentration (at the Market and Athol sites) as a background value. This results in a background and transport value of 3 µg/m³, as opposed to 27 µg/m³ in the 1991 plan and 0 µg/m³ in the 1995 plan.

Emissions and corresponding concentration differences between ‘Attainment Plan’ and ‘Actual’ for each emission category can be traced to continual improvements in emission inventory data sources and methodologies. These improvements have also led to the addition of several new emission categories, including landfill operations, unpaved road travel, and wind erosion unpaved roads. In addition, the attainment plan included a forecasted 1994 inventory, and this document

includes an actual 1994 inventory. The actual 1994 inventory is improved by including actual industry emissions for 1994.

Another difference in 1994 results from the implementation of control measures; the 1991 attainment plan assumed that wind erosion disturbed areas would be affected in 1994 by the implementation of a control measure (treatment of public disturbed areas). This resulted in the wind erosion disturbed areas emissions and concentrations dropping by around 30 percent from 1991 to 1994. This control measure was not implemented until September 1995, so the present 1994 emissions and concentrations are not reduced.

Table Three
Rollback Attainment Demonstration (1990-1994)

Background/Transport	Attainment Plan				Actual			
	1990		1994		1990		1994	
	tpd	ug/m ³	tpd	ug/m ³	tpd	ug/m ³	tpd	ug/m ³
Background/Transport	n/a	0	n/a	0	n/a	3	n/a	3
Electric Generation	0.06	1	0.07	1	0.03	1	0.05	1
Landfill Operations	0.00	0	0.00	0	0.03	1	0.03	1
Mineral Mining (NACC)	7.00	132	4.03	76	8.56	192	4.50	101
Construction/Demolition	0.60	11	0.52	10	0.14	3	0.11	2
Unpaved Road Travel	0.00	0	0.00	0	0.38	9	0.38	9
Activity on BLM Lands	0.75	14	0.60	11	0.24	5	0.19	4
Wind Erosion Disturbed Areas	3.42	64	2.46	46	0.34	8	0.34	8
Wind Erosion Unpaved Roads	0.00	0	0.00	0	0.04	1	0.04	1
Paved Road Dust	0.17	3	0.17	3	0.14	3	0.15	3
On-Road Exhaust and Tire Wear	0.10	2	0.10	2	0.06	1	0.05	1
Miscellaneous Sources	0.01	0	0.01	0	0.09	2	0.09	2
Totals:	12.11	228	7.96	150	10.05	228	5.93	136

Part Two

Maintenance Plan

Chapter 4

Regional Forecast

Forecasted Emission Inventory

Growth Codes

General Emission Inventory

Linear Rollback Model Forecast

Forecasted Emission Inventory

42 U.S.C. §7505a (FCAA §175A) requires a maintenance plan to include an emission inventory that covers at least 10 years beyond the redesignation date. Existing emission inventories for the Trona region were only required to forecast regional emissions through 1994, the mandatory moderate classification attainment date. An emission inventory has been prepared for the Trona region that forecasts emissions through the year 2010, including 1997 and 2000 as milestone years. This forecasted inventory covers 16 years beyond the attainment date, and at least 10 years beyond the expected redesignation date.

Figure Five displays the Trona region actual emission inventory for 1990 through 1994, and the forecasted emission inventories for 1997, 2000 and 2010. The region's PM₁₀ emission inventory declines from 1990 through 1997, and then remains level through the year 2010. The complete regional emission inventory is presented in Appendix B, including forecasted emission inventories for future years.

Growth Codes

Forecasted inventories are estimated by multiplying a base year value for each category by a 'growth code' for a given future year. The 'growth code' is indexed to the base year (1990 for this document), so that its value for the base year is 1.00. This allows the growth code to estimate future activity in terms of emissions; if the growth code for the year 2000 is 1.50, activity in that category (and resulting emissions) is expected to be 50 percent greater than in 1990. The growth codes used to forecast future years are presented in Appendix B.

Overall, the growth codes used for the Trona region reflect the lack of historical change and lack of expected change in the region. No significant population increase in the area is expected. Local industry was contacted to obtain their estimates of future industrial activity. Two categories grow: employment, to allow for a slow increase in operations; and on-road vehicle miles traveled, to allow for increased through traffic to Death Valley and increased industrial shipping traffic. The growth code for 'electric generation' is unusual, as it fluctuates between 1.61 and 2.02. This is due to the nature of the source that is the basis for the growth code, Ace. This facility began operations during 1990, and did not have a full year of operations until 1991. Hence, the ratio of each full year's activity to the partial 1990 year activity will always be greater than one.

General Emission Inventory

Appendix B contains a detailed breakdown of the Trona region emission inventory, including details on the calculation methodology for each area source category. This inventory employs a 1990 baseyear. Stationary source information is included for 1990, 1991, 1992, 1993 and 1994 when available. Stationary source information includes each process and equipment group on a facility basis.

The Trona region emission inventory is dominated by mineral mining stationary source emissions (85% of 1990 total), which are in turn dominated by emissions from the several Searles Lake brine processing facilities operated by NACC. Other significant source categories are Unpaved Road Travel (4%), Wind Erosion from Disturbed Areas (3%), Activity on BLM Lands (2%), and Construction (1%). Miscellaneous categories make up the rest of the PM₁₀ emissions in the region (3%, with on-road motor vehicle exhaust and tire wear noticeably insignificant (less than one percent of the 1990 total).

What follows is a brief discussion of selected major inventory categories to present interesting facts. Please refer to Appendix B for a more detailed treatment:

Mineral Mining emissions feature a wide variety of sources, with significant fugitive emissions. In general, the non-fugitive emissions have well-understood emission levels, as they are exhausted to the atmosphere through air pollution control equipment (baghouses, electrostatic precipitators, and scrubbers, for example) that are periodically source-tested. Fugitive emissions have been estimated using best available methods, with the exception of industrial roads and wind erosion. MDAQMD and NACC performed some limited road surface silt loading testing of NACC roads and operating surfaces in 1993 to establish controlled and uncontrolled levels. The results of this testing were used to estimate the emissions from wind erosion and road travel on NACC facilities (including industrial operations on Searles Lake).

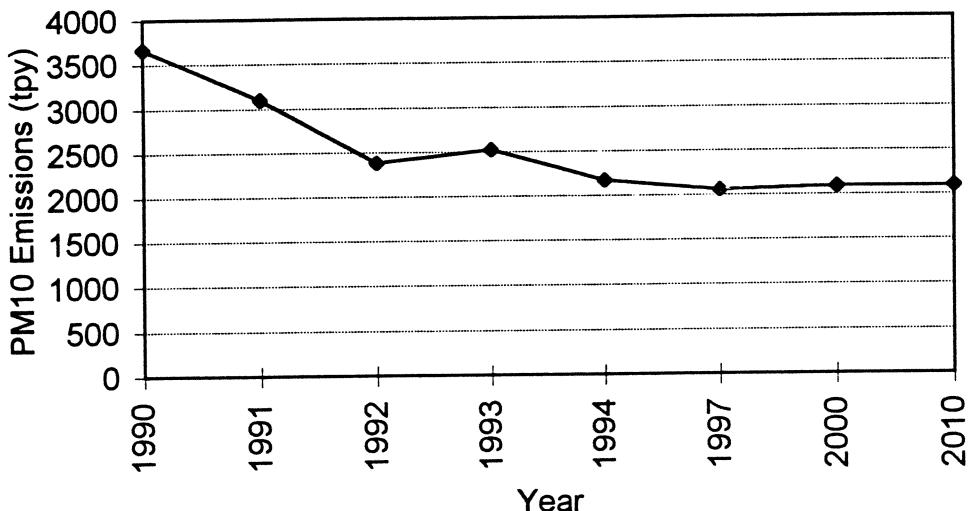
Unpaved Road Travel emissions are estimated using San Bernardino County road location, length, and activity data, and assumptions consistent with the rest of MDAQMD.

Wind Erosion from disturbed areas emissions are estimated based on one-sixth of the occupied area being disturbed on a daily basis (210 of 1247 acres). This area is then estimated to erode as per the United States Department of Agriculture wind erosion equation.

Activity on BLM Lands emissions are estimated based on casual route use, permitted off-road events, and Pinnacles filming activity information as provided by BLM.

Construction/Demolition emissions are conservatively estimated based on 1.1 percent (Trona region population fraction) of total MDAQMD construction.

Figure Five
Trona Region PM₁₀ Emission Inventory Trend



Linear Rollback Model Forecast

42 U.S.C. §7505a (FCAA §175A) requires a maintenance plan to demonstrate that ambient concentrations will not exceed the PM₁₀ NAAQS for at least ten years after the redesignation date. The same linear rollback system that was used to evaluate attainment in the Trona region can be used to evaluate future ambient concentrations in the region. This is done by comparing the forecasted emission inventory to the base year emission inventory, and using the established concentration-to-emissions relationships. Please refer to Chapter 3 for details on the calculation and analysis procedures.

The results of the linear rollback model forecast are presented in Table Four. As there is no dramatic change in the emission inventory from the attainment year, 1994, through 2010, there is no dramatic change in expected ambient concentrations over the same period. The linear rollback model forecasts that the region will not experience any exceedances of the NAAQS through the year 2010.

Table Four
Linear Rollback Forecast (1990-2010)

Background/Transport	Actual						Forecast					
	1990		1994		1997		2000		2010			
	tpd	ug/m ³	tpd	ug/m ³	tpd	ug/m ³	tpd	ug/m ³	tpd	ug/m ³	n/a	3
Background/Transport	n/a	3	n/a	3	n/a	3	n/a	3	n/a	3	n/a	3
Electric Generation	0.03	1	0.05	1	0.06	1	0.06	1	0.06	1	0.06	1
Landfill Operations	0.03	1	0.03	1	0.03	1	0.03	1	0.03	1	0.03	1
Mineral Mining (NACC)	8.56	192	4.50	101	4.28	96	4.36	98	4.36	98		
Construction/Demolition	0.14	3	0.11	2	0.11	2	0.11	2	0.11	2	0.11	2
Unpaved Road Travel	0.38	9	0.38	9	0.38	9	0.38	9	0.38	9	0.38	9
Activity on BLM Lands	0.24	5	0.19	4	0.19	4	0.19	4	0.19	4	0.19	4
Wind Erosion Disturbed Areas	0.34	8	0.34	8	0.24	5	0.24	5	0.24	5	0.24	5
Wind Erosion Unpaved Roads	0.04	1	0.04	1	0.04	1	0.04	1	0.04	1	0.04	1
Paved Road Dust	0.14	3	0.15	3	0.15	3	0.16	4	0.17	4		
On-Road Exhaust and Tire Wear	0.06	1	0.05	1	0.05	1	0.05	1	0.06	1		
Miscellaneous Sources	0.09	2	0.09	2	0.10	2	0.10	2	0.10	2		
Totals:	10.05	228	5.93	136	5.63	129	5.72	131	5.74	132		

Chapter 5

Control Measures

Additional Measures

Contingency Measures

Additional Measures

42 U.S.C. §7505a(a) (FCAA §175A(a)) requires maintenance plans to include sufficient additional control measures to ensure compliance of the NAAQS. The Trona region is forecasted to have a relatively level emission inventory through the year 2010. Linear rollback analysis of this emission inventory forecast under ‘design day’ or worst-case conditions indicates ambient concentrations will not approach the PM₁₀ NAAQS. Accordingly, no additional control measures are required to maintain ambient concentrations below the PM₁₀ NAAQS.

Contingency Measures

42 U.S.C. §7505a(a) (FCAA §175A(a)) requires maintenance plans to include contingency measures sufficient to assure that any violation of the NAAQS that occurs after redesignation will be corrected. The Searles Valley PM₁₀ Plan was revised on June 28, 1995 to include a contingency measure. MDAQMD Rule 403.1 - *Fugitive Dust Control for the Searles Valley Planning Area* was amended on July 31, 1995 to incorporate the contingency measure into a federally-enforceable implementation mechanism.

This contingency measure is a requirement to chemically stabilize a minimum of 46 acres of disturbed surfaces to at least a 90% control level.

This contingency measure has not been triggered or otherwise activated. Disturbed surfaces are still a significant fraction of the emission inventory. MDAQMD believes that this contingency measure is also appropriate for application during the maintenance period. MDAQMD will amend Rule 403.1 to remove the December 31, 1995 sunset clause and make the contingency measure applicable indefinitely.

Part Three

Redesignation Request

Chapter 6

Requirements

Redesignation

Requirements

Redesignation

The Trona region has attained the PM₁₀ NAAQS. No PM₁₀ NAAQS exceedances have been registered since December of 1990, a five year period. The federal attainment planning process has worked in the area; as a direct result of that process, substantial, permanent PM₁₀ emission reductions have been generated. In addition, mechanisms have been put in place to ensure that no future exceedances will occur. See previous chapters for justification of these statements.

Accordingly, MDAQMD requests that the San Bernardino County portion of the Searles Valley Federal PM₁₀ Nonattainment Area (referred to as the 'Trona region' in this document) be redesignated from 'nonattainment' to 'attainment' for the Federal PM₁₀ NAAQS.

Requirements

42 U.S.C. §7407(d)(3)(E) (FCAA §107(d)(3)(E)) presents the requirements which must be met to allow the Trona region to be redesignated to attainment. All of the requirements have been met, or will be met through approval of this document. The requirements are:

1. The area must have attained the NAAQS (refer to Chapter 2). [42 U.S.C. §7407(d)(3)(E)(i) (FCAA §107(d)(3)(E)(i))]
2. An implementation plan must have been approved for the area (refer to Chapter 1). [42 U.S.C. §7407(d)(3)(E)(ii) (FCAA §107(d)(3)(E)(ii))]
3. The area's improvement in air quality must be determined to be the result of permanent and enforceable reductions in emission resulting from implementation of the applicable implementation plan and other permanent and enforceable mechanisms (refer to Chapter 2). [42 U.S.C. §7407(d)(3)(E)(iii) (FCAA §107(d)(3)(E)(iii))]
4. A maintenance plan must have been approved for the area (this document contains a maintenance plan for the area; approval of this document constitutes approval of a maintenance plan for the area). [42 U.S.C. §7407(d)(3)(E)(iv) (FCAA §107(d)(3)(E)(iv))]
5. All implementation plan and nonattainment area requirements must have been met for the area (see chapter 1). [42 U.S.C. §7407(d)(3)(E)(v) (FCAA §107(d)(3)(E)(v))]

Appendix A

Air Quality Data

Ambient PM₁₀ Concentrations and Annual Arithmetic Means:

- 1985 Market Street, ACE-1 (daily), ACE-2 (daily), ACE-3 (daily)
- 1986 Market Street, ACE-1 (daily), ACE-2 (daily), ACE-3 (daily)
- 1987 Market Street, ACE-2 (daily), ACE-3 (daily)
- 1988 Market Street, ACE-2, ACE-3
- 1989 Market Street, ACE-2, ACE-3, ACE-5, ACE-6
- 1990 Market Street, ACE-2, ACE-3, ACE-5, ACE-6
- 1991 Market Street, ACE-2 (incomplete), ACE-3, ACE-5 (incomplete), ACE-6 (incomplete)
- 1992 Market Street, ACE-3
- 1993 Athol Street, Market Street, ACE-3
- 1994 Athol Street, Market Street (incomplete), ACE-3
- 1995 Athol Street (through September), ACE-3 (through June)

Trona PM10 Data (MDAQMD Stations)

1985				1986				1987					
Date	Market	ACE-1	ACE-2	ACE-3	Date	Market	ACE-1	ACE-2	ACE-3	Date	Market	ACE-2	ACE-3
1/1/85		27	24		01/01/86		39	32	24	01/01/87		81	25
1/2/85		44	52		01/02/86	56	36	42	32	01/02/87		87	49
1/3/85		37	33	20	01/03/86		39	47	35	01/03/87	63	61	50
1/4/85		63	53	38	01/04/86		21	30	16	01/04/87		13	12
1/5/85		72	53		01/05/86			15	9	01/05/87		11	8
1/6/85		60	56	41	01/06/86		26	36	24	01/06/87		12	12
1/7/85		17	24	12	01/07/86		11	30	12	01/07/87		15	9
1/8/85		17	25	12	01/08/86	39	56	57	25	01/08/87		23	12
1/9/85		31	30	13	01/09/86		64	63	37	01/09/87		23	9
1/10/85		16	38	29	01/10/86		115	78	33	01/10/87		27	19
1/11/85		26	48	18	01/11/86		75	76	38	01/11/87		45	20
1/12/85		18	95	38	01/12/86		93	102	52	01/12/87		39	
1/13/85					01/13/86			94	63	01/13/87		40	19
1/14/85		93	103	44	01/14/86	78	47	43	35	01/14/87	65	32	17
1/15/85		50		34	01/15/86		22	25	19	01/15/87		53	13
1/16/85		26	53	48	01/16/86		37	37	25	01/16/87		33	12
1/17/85		86	82	34	01/17/86		42	47	32	01/17/87		56	19
1/18/85		127	94	99	01/18/86		57	59	41	01/18/87		69	54
1/19/85		78	89	30	01/19/86		54	45	39	01/19/87		79	38
1/20/85		75	59	45	01/20/86		25	53	17	01/20/87		58	22
1/21/85		57	66	28	01/21/86		32	50	26	01/21/87	55	67	21
1/22/85		27	59	40	01/22/86	102	52	53	29	01/22/87		48	57
1/23/85		30	53	22	01/23/86		23		38	01/23/87		56	36
1/24/85		36	65		01/24/86		28	45	28	01/24/87		31	13
1/25/85		59	56	27	01/25/86		31	59	31	01/25/87		47	30
1/26/85		51	44	29	01/26/86		65	78	31	01/26/87		54	47
1/27/85		32	43	18	01/27/86		87	87	45	01/27/87	53	45	46
01/28/85	53	30	50	28	01/28/86		67	73	51	01/28/87		32	71
1/29/85		19	35	15	01/29/86		80	123	58	01/29/87		33	22
01/30/85		29	111	27	01/30/86		13	13	15	01/30/87		40	35
1/31/85		23	63	21	01/31/86		14	19	14	01/31/87		47	38
02/01/85		21	40	28	02/01/86	28	28	26	21	02/01/87		72	39
02/02/85		25	30	20	02/02/86		19	21	11	02/02/87	55	74	35
02/03/85		7	13	13	02/03/86		13	22	9	02/03/87		38	28
02/04/85		15	36	14	02/04/86		7	24	13	02/04/87		101	
02/05/85		31	42	24	02/05/86		21	24	10	02/05/87		46	24
02/06/85		43	85	39	02/06/86		13	30	9	02/06/87		36	25
02/07/85		50	75	38	02/07/86	28	25	40	20	02/07/87		49	36
02/08/85	319	20	108	138	02/08/86		15	20	12	02/08/87		78	51
02/09/85		9	17	46	02/09/86		7	30	7	02/09/87		56	41
02/10/85		28	57		02/10/86		26	43	15	02/10/87		24	14
02/11/85		54	82	42	02/11/86		36	40		02/11/87		31	
02/12/85	50	52	94	46	02/12/86		19	30	18	02/12/87		31	15
02/13/85		48	86	50	02/13/86	9	4	8	6	02/13/87		22	37
02/14/85		44	98	36	02/14/86		10	14	12	02/14/87		24	15
02/15/85		57	84	53	02/15/86		5	9	15	02/15/87		29	28
02/16/85		98	145	45	02/16/86			8	20	02/16/87		32	11
02/17/85		72	61		02/17/86		6	22		02/17/87		48	18
02/18/85		33	90	27	02/18/86		3	8		02/18/87		56	23
02/19/85		43	81		02/19/86	12	4	11	16	02/19/87		139	25
02/20/85		141		166	02/20/86		8	13		02/20/87		25	8
02/21/85		63	174	58	02/21/86		24	35	12	02/21/87		50	25
02/22/85		36	90	42	02/22/86		43	52	29	02/22/87		26	22

1985				1986				1987					
Date	Market	ACE-1	ACE-2	ACE-3	Date	Market	ACE-1	ACE-2	ACE-3	Date	Market	ACE-2	ACE-3
02/23/85		36	72	39	02/23/86		36	51	23	02/23/87		83	
02/24/85	65	52	72	32	02/24/86		41	61	26	02/24/87		16	41
02/25/85		58	86	76	02/25/86	76	34	50	20	02/25/87		10	14
02/26/85		41	53	28	02/26/86		43	56	22	02/26/87		22	
02/27/85		42	61	41	02/27/86				18	02/27/87		25	
02/28/85		45	64	30	02/28/86		40	59	28	02/28/87		42	19
03/01/85		51	145	141	03/01/86		44	38	30	03/01/87		38	20
03/02/85	210	113	179	167	03/02/86		37	58	23	03/02/87		42	
03/03/85		322	308	345	03/03/86	77			28	03/03/87		50	
03/04/85		33	69	57	03/04/86		26	41		03/04/87		57	
03/05/85		26	50	76	03/05/86		30	26	20	03/05/87			
03/06/85		10			03/06/86		32	40		03/06/87		21	
03/07/85		12	38		03/07/86		21	49	49	03/07/87		8	
03/08/85		52	83	38	03/08/86		3			03/08/87		13	10
03/09/85		50	65	34	03/09/86	12	6			03/09/87		21	15
03/10/85		18	37	34	03/10/86		3			03/10/87		17	16
03/11/85		9	26	26	03/11/86		16	13	9	03/11/87		21	10
03/12/85		20	43	22	03/12/86		8	16	12	03/12/87		29	23
03/13/85		36	50	31	03/13/86		10	14		03/13/87		16	
03/14/85	122	57	71	28	03/14/86		11	12	9	03/14/87		25	97
03/15/85		18	46	20	03/15/86	15	10	14	14	03/15/87		20	9
03/16/85		31	23	33	03/16/86		4	4	4	03/16/87	27		11
03/17/85		29			03/17/86		10	12	7	03/17/87		24	
03/18/85					03/18/86		9	33	11	03/18/87		95	150
03/19/85			27		03/19/86		14	23	12	03/19/87		16	13
03/20/85	42	31	43	31	03/20/86		31	27	12	03/20/87		25	12
03/21/85		37	33		03/21/86	52	23	36	12	03/21/87		12	35
03/22/85		26	62	39	03/22/86		30	36	14	03/22/87	20	20	9
03/23/85		50			03/23/86		26	32	19	03/23/87		20	9
03/24/85		42	74	94	03/24/86		21	34	27	03/24/87		11	4
03/25/85		26	52	41	03/25/86		25	44	25	03/25/87		23	11
03/26/85	496	134	373		03/26/86		40	49	24	03/26/87		25	16
03/27/85		235	382		03/27/86		38	44	24	03/27/87		29	20
03/28/85		55	85		03/28/86	68		47	40	03/28/87	29	13	8
03/29/85		27	53	24	03/29/86			33	29	03/29/87		26	15
03/30/85		17		14	03/30/86		27	31	24	03/30/87		29	13
03/31/85		27	43	20	03/31/86		22	27	23	03/31/87		30	14
04/01/85	43	19	39	17	04/01/86			36	67	04/01/87		32	
04/02/85		38	56	21	04/02/86		153	177	138	04/02/87		36	40
04/03/85			66	30	04/03/86	61	30	56	39	04/03/87	75	32	20
04/04/85		36	64	29	04/04/86		38	42	37	04/04/87		22	10
04/05/85		63	67	33	04/05/86		46	40	42	04/05/87		24	17
04/06/85		46	57	33	04/06/86		7	7	8	04/06/87			
04/07/85	44	48	56		04/07/86		6	7	9	04/07/87			
04/08/85		61	63	38	04/08/86	29	15	20	15	04/08/87		45	26
04/09/85		38	56	49	04/09/86		17	23	16	04/09/87	70	38	25
04/10/85		35	44	35	04/10/86		29		21	04/10/87		45	48
04/11/85		37			04/11/86			37	36	04/11/87		24	19
04/12/85		30	57	33	04/12/86		20	44	88	04/12/87		43	24
04/13/85	94	38	70	78	04/13/86		10	16	12	04/13/87		42	16
04/14/85		40	53	37	04/14/86		28	41	22	04/14/87		48	26
04/15/85		23	49	47	04/15/86		29	33	55	04/15/87	112	58	33
04/16/85		22	40	49	04/16/86		9	16	20	04/16/87		63	40
04/17/85		17	33	46	04/17/86		12	16	11	04/17/87		68	83

1985				1986				1987					
Date	Market	ACE-1	ACE-2	ACE-3	Date	Market	ACE-1	ACE-2	ACE-3	Date	Market	ACE-2	ACE-3
04/18/85		26	35	30	04/18/86		19	15		04/18/87		97	230
04/19/85	123	32	88	47	04/19/86		24	36	20	04/19/87		29	28
04/20/85		37	54	38	04/20/86	54	24	28	15	04/20/87		43	
04/21/85		22	28	33	04/21/86		25	33	24	04/21/87	102	40	28
04/22/85		17	28	20	04/22/86		29	46	41	04/22/87		47	60
04/23/85		45	54	32	04/23/86		21	27	33	04/23/87		44	
04/24/85		79	55	57	04/24/86		26	37	39	04/24/87		36	
04/25/85		99	165	120	04/25/86		24	35	50	04/25/87		40	39
04/26/85			72	37	04/26/86		24	31	30	04/26/87		30	35
04/27/85		27	30	19	04/27/86		17	30	19	04/27/87	53	41	23
04/28/85		36	38	39	04/28/86		20	39	49	04/28/87		24	
04/29/85		34	41	40	04/29/86		23	24	28	04/29/87		25	23
04/30/85		57	68	34	04/30/86		33	44	47	04/30/87		22	49
05/01/85	80	43	62	49	05/01/86		31	35	49	05/01/87		21	24
05/02/85		44	53	57	05/02/86	32	24	22	40	05/02/87		32	19
05/03/85		53	57	56	05/03/86		23	31	58	05/03/87	40	37	17
05/04/85		54	57	41	05/04/86		9	12	17	05/04/87		37	22
05/05/85		32	51	48	05/05/86		16	31	57	05/05/87		49	28
05/06/85			51	51	05/06/86		26	40	55	05/06/87		42	23
05/07/85	43	35	45	47	05/07/86		27	27	28	05/07/87		27	18
05/08/85		28	35	51	05/08/86		25	26	21	05/08/87		18	11
05/09/85		19	29	51	05/09/86		32	26	20	05/09/87	42	18	16
05/10/85		23	22	45	05/10/86		18		63	05/10/87		27	17
05/11/85		22	27	31	05/11/86		23	22	30	05/11/87		26	17
05/12/85		24	25	24	05/12/86		36	43	26	05/12/87		27	21
05/13/85		36	47	31	05/13/86		38	40	30	05/13/87		28	16
05/14/85		32	44	60	05/14/86	49	33		42	05/14/87		22	
05/15/85		37	45	51	05/15/86		35	33	30	05/15/87	30	26	18
05/16/85	26	54	33	33	05/16/86		29	34	25	05/16/87		24	22
05/17/85		38	55	34	05/17/86		19	21	19	05/17/87		22	18
05/18/85		43	41	45	05/18/86		39	33	24	05/18/87		29	40
05/19/85		38	44	47	05/19/86		31	26	41	05/19/87		28	26
05/20/85		46	66	53	05/20/86		24	33	54	05/20/87		30	39
05/21/85		49	11		05/21/86		32		66	05/21/87	23	20	18
05/22/85		39	49	35	05/22/86		52	58	71	05/22/87		27	26
05/23/85		43	54	52	05/23/86		51	55	45	05/23/87		35	30
05/24/85		31	38	46	05/24/86		38	52	37	05/24/87		33	55
05/25/85	48	46	76		05/25/86		43	56	38	05/25/87		26	
05/26/85		31	35	50	05/26/86			49	44	05/26/87		25	25
05/27/85		24	31	50	05/27/86		38	48	46	05/27/87	23	22	23
05/28/85		28	33	48	05/28/86		40	43	45	05/28/87		22	28
05/29/85		26			05/29/86		39	54	48	05/29/87		35	32
05/30/85		46	47	50	05/30/86		35	38	44	05/30/87		37	34
05/31/85	40	40	50	78	05/31/86		26	57	48	05/31/87		36	
06/01/85		31	36	34	06/01/86	100	43	42	44	06/01/87		40	26
06/02/85		46	65	92	06/02/86		36	46	52	06/02/87	58	41	29
06/03/85		22	20	17	06/03/86		42	37	53	06/03/87		30	
06/04/85		28	40	29	06/04/86			47	53	06/04/87		46	29
06/05/85		28	34	42	06/05/86		28	35	45	06/05/87		44	25
06/06/85	30	27	37	30	06/06/86		30	36	36	06/06/87		18	
06/07/85		34	66	43	06/07/86	34	38	40	45	06/07/87		18	15
06/08/85		39	45	44	06/08/86		29	52	27	06/08/87	57	21	14
06/09/85		38	35	40	06/09/86		18	43	25	06/09/87		27	20
06/10/85		34	56	41	06/10/86		24	45	33	06/10/87		32	30

1985				1986				1987					
Date	Market	ACE-1	ACE-2	ACE-3	Date	Market	ACE-1	ACE-2	ACE-3	Date	Market	ACE-2	ACE-3
06/11/85		44	52	40	06/11/86		39	45	42	06/11/87		33	32
06/12/85		57	62	67	06/12/86		39	52	53	06/12/87		37	
06/13/85		44	44	58	06/13/86	40	42	45	44	06/13/87		31	35
06/14/85			57	51	06/14/86		36	57	61	06/14/87	24	25	
06/15/85		56	48	48	06/15/86		27	32	40	06/15/87		20	45
06/16/85		42	48	51	06/16/86		26	37	41	06/16/87		25	28
06/17/85		46	45	48	06/17/86		27	36	37	06/17/87		32	35
06/18/85	53	48	64	51	06/18/86		46	50		06/18/87		31	32
06/19/85		52	51	56	06/19/86	37	31	40	39	06/19/87		32	38
06/20/85		37	49	44	06/20/86		31	50	40	06/20/87	33	34	34
06/21/85		45	44	62	06/21/86		34	44	32	06/21/87		34	41
06/22/85		47	57	62	06/22/86		37	52	35	06/22/87		45	35
06/23/85		38	36	37	06/23/86		34	55	40	06/23/87		50	38
06/24/85	35		46	41	06/24/86		39	52	44	06/24/87		59	34
06/25/85		49	44	43	06/25/86	45	33	47	43	06/25/87		46	32
06/26/85		31	53	38	06/26/86		25	40	39	06/26/87	33		34
06/27/85		48	57	43	06/27/86		27	40	33	06/27/87		47	65
06/28/85		73	67	89	06/28/86		26	39	37	06/28/87		41	44
06/29/85		45	52	65	06/29/86		31	38		06/29/87		39	37
06/30/85	31	31	36	33	06/30/86		28	42		06/30/87		36	36
07/01/85		31	31	30	07/01/86	32	31			07/01/87		39	46
07/02/85		63	49	41	07/02/86		29	52	40	07/02/87	30	33	34
07/03/85		57	52	43	07/03/86		39	46	52	07/03/87		37	56
07/04/85		62	74	55	07/04/86		53	68	99	07/04/87		32	36
07/05/85		96	58	41	07/05/86		25	31	38	07/05/87		27	39
07/06/85	54	56	65	52	07/06/86		19	23	31	07/06/87		28	23
07/07/85		45	47	46	07/07/86	24	18	21		07/07/87		39	28
07/08/85		72	81	49	07/08/86		27	41	50	07/08/87	37	45	37
07/09/85		63	57	62	07/09/86		32	41		07/09/87		34	38
07/10/85		63	63	57	07/10/86		30	51	39	07/10/87		41	47
07/11/85		51	55	63	07/11/86		38	42	39	07/11/87		32	39
07/12/85	36	52		66	07/12/86		39	48	45	07/12/87		36	29
07/13/85		53	49	45	07/13/86	23	26	30	39	07/13/87		52	39
07/14/85		66	51		07/14/86		41	62	52	07/14/87	74	48	37
07/15/85		57	46	59	07/15/86		23	26	26	07/15/87		49	33
07/16/85		61	79	58	07/16/86		26	43	50	07/16/87		70	75
07/17/85		42	40	55	07/17/86		23	26	37	07/17/87		45	119
07/18/85	40	44	80	49	07/18/86		26	36	31	07/18/87		20	31
07/19/85		37	38	35	07/19/86	29	30	47	30	07/19/87		19	20
07/20/85		36	42	41	07/20/86		20	62	36	07/20/87	23	26	22
07/21/85		35	27	31	07/21/86		35	54	49	07/21/87		19	33
07/22/85		41	44	42	07/22/86		25	27	27	07/22/87		23	
07/23/85		29		32	07/23/86		19		18	07/23/87		33	32
07/24/85	43	40	60	42	07/24/86		19	24	23	07/24/87		31	30
07/25/85		49	56	38	07/25/86	30	25	30	34	07/25/87		28	29
07/26/85		43	60	50	07/26/86		29	29	31	07/26/87	40	40	26
07/27/85		47	44	40	07/27/86		28			07/27/87		43	33
07/28/85		37	46	47	07/28/86		28	34	28	07/28/87		33	34
07/29/85			74	85	07/29/86		32	44	34	07/29/87		37	38
07/30/85	34	27	32	28	07/30/86		34	48	33	07/30/87		40	28
07/31/85		39	38	53	07/31/86	42		45	33	07/31/87			31
08/01/85		14			08/01/86		43	29	50	08/01/87	61	44	29
08/02/85		29	43		08/02/86		32	42	30	08/02/87		37	26
08/03/85		35	65	40	08/03/86		26		26	08/03/87		42	30

1985				1986				1987					
Date	Market	ACE-1	ACE-2	ACE-3	Date	Market	ACE-1	ACE-2	ACE-3	Date	Market	ACE-2	ACE-3
08/04/85		32	45	41	08/04/86		24	21		08/04/87		46	35
08/05/85	39	29	57	34	08/05/86		25	34		08/05/87		53	46
08/06/85		35	50	35	08/06/86	29	28	31	30	08/06/87		43	55
08/07/85			41	42	08/07/86		37	27	30	08/07/87	30	33	33
08/08/85		43	67	56	08/08/86		33	37	31	08/08/87		36	29
08/09/85		36	64	45	08/09/86		37			08/09/87		35	27
08/10/85		44	72	71	08/10/86		33	37	35	08/10/87		37	51
08/11/85		36	53	45	08/11/86			49		08/11/87		36	37
08/12/85		37	51	47	08/12/86	21		43	39	08/12/87		33	44
08/13/85		37	57	42	08/13/86		36		39	08/13/87	26	29	28
08/14/85		39	58	46	08/14/86		35	41	36	08/14/87		48	87
08/15/85		38	54	49	08/15/86		25		40	08/15/87		28	23
08/16/85		34	47	36	08/16/86		27	31	30	08/16/87		36	25
08/17/85		26	40	32	08/17/86		31	47	15	08/17/87		47	27
08/18/85		27	29	51	08/18/86	50	19	35		08/18/87			38
08/19/85		27	41	50	08/19/86		20	36		08/19/87		43	33
08/20/85		27	39	36	08/20/86		27	39	30	08/20/87		33	32
08/21/85		33	47	20	08/21/86		23	36		08/21/87		29	30
08/22/85		41	55	33	08/22/86		30	39	29	08/22/87	22	20	19
08/23/85	83	47	83	50	08/23/86		32	41	35	08/23/87		28	30
08/24/85		49	78	37	08/24/86	35	35	41	36	08/24/87		31	28
08/25/85		49	70	49	08/25/86		36		35	08/25/87	49	46	34
08/26/85		36	55	52	08/26/86		26	36	25	08/26/87		40	43
08/27/85		30	49	42	08/27/86		7	17	6	08/27/87		37	35
08/28/85		36	47	36	08/28/86			25	17	08/28/87			
08/29/85	29	22	41	24	08/29/86			44	37	08/29/87		50	32
08/30/85		48	59	42	08/30/86	31	26	31	35	08/30/87		40	32
08/31/85		31	47	37	08/31/86			29		08/31/87	81	44	27
09/01/85		34	53	71	09/01/86		36	46	33	09/01/87		43	28
09/02/85		20	59	89	09/02/86		34	53	34	09/02/87			42
09/03/85		22	27	32	09/03/86			52	34	09/03/87		63	60
09/04/85	30		22	20	09/04/86		38	59	35	09/04/87		63	50
09/05/85		20	40	22	09/05/86	53	45	66	41	09/05/87			29
09/06/85		23	31	25	09/06/86			57	46	09/06/87	50		30
09/07/85		25	28	26	09/07/86		40	39	39	09/07/87		47	45
09/08/85		17	27	28	09/08/86		19	38	43	09/08/87		52	40
09/09/85		28	25	36	09/09/86		19	105	78	09/09/87		49	32
09/10/85	29	18	28	27	09/10/86		30	50		09/10/87			34
09/11/85		13	19	23	09/11/86	40	41	51	30	09/11/87		44	5
09/12/85		41	45	25	09/12/86		36	41	41	09/12/87	45	42	38
09/13/85		37	65	34	09/13/86		39	44	52	09/13/87		37	34
09/14/85		31	54	39	09/14/86		24	34	46	09/14/87		51	38
09/15/85		94	39	36	09/15/86		17	31	26	09/15/87		51	63
09/16/85	54	30	35	37	09/16/86		16	35	42	09/16/87		48	36
09/17/85		30	51	83	09/17/86	19	12	26	28	09/17/87		57	40
09/18/85		19	33	25	09/18/86			19	24	09/18/87	70	59	46
09/19/85		14	17	15	09/19/86		18	36	39	09/19/87		55	48
09/20/85		23	32	20	09/20/86		17	30	18	09/20/87		59	30
09/21/85		29	44	19	09/21/86		19	28	17	09/21/87		59	42
09/22/85		37	42	29	09/22/86			36	27	09/22/87		68	60
09/23/85		46	65	38	09/23/86	26		46	21	09/23/87		23	36
09/24/85		49	70	38	09/24/86		18	47	71	09/24/87	21	22	18
09/25/85		42	53	41	09/25/86		9	26	31	09/25/87		52	51
09/26/85		28	46	35	09/26/86		15	59	28	09/26/87		53	28

1985				1986				1987					
Date	Market	ACE-1	ACE-2	ACE-3	Date	Market	ACE-1	ACE-2	ACE-3	Date	Market	ACE-2	ACE-3
09/27/85		33	39	32	09/27/86		20	26	20	09/27/87		55	39
09/28/85	71	34	44	31	09/28/86			30	18	09/28/87		61	28
09/29/85		30	38	38	09/29/86	56			32	09/29/87		48	22
09/30/85		36	37	34	09/30/86				54	09/30/87	126	50	21
10/01/85		37	58	29	10/01/86				23	10/01/87		71	34
10/02/85		39	29	28	10/02/86				9	10/02/87		78	25
10/03/85		47	59	26	10/03/86				9	10/03/87		45	21
10/04/85	39	44		23	10/04/86				11	10/04/87		51	24
10/05/85		37	45	39	10/05/86	48			17	10/05/87		51	33
10/06/85		26	59	75	10/06/86				19	10/06/87	57	56	35
10/07/85		29	50	25	10/07/86					10/07/87		65	39
10/08/85		23	33	37	10/08/86				24	10/08/87		54	32
10/09/85		22	28	20	10/09/86					10/09/87		45	41
10/10/85		17	30	20	10/10/86					10/10/87		49	40
10/11/85		46	55	30	10/11/86				35	10/11/87		42	35
10/12/85		34	40	39	10/12/86				23	10/12/87	23	20	17
10/13/85		22	47	18	10/13/86					10/13/87			32
10/14/85		18	32	15	10/14/86				76	10/14/87		57	36
10/15/85		20	41	33	10/15/86				72	10/15/87		52	37
10/16/85		46	61	46	10/16/86					10/16/87		51	53
10/17/85		35	66	44	10/17/86	46				10/17/87		55	33
10/18/85		73	79	54	10/18/86				46	10/18/87	117	45	24
10/19/85		59	69	40	10/19/86				22	10/19/87		66	36
10/20/85	28	46	33		10/20/86				27	10/20/87		55	24
10/21/85		35	53		10/21/86				28	10/21/87			38
10/22/85		28	37	22	10/22/86				41	10/22/87		20	15
10/23/85		38		30	10/23/86	46			37	10/23/87		32	12
10/24/85		54	73	40	10/24/86				61	10/24/87	11	19	11
10/25/85		34	71	41	10/25/86				66	10/25/87		15	68
10/26/85		41	70	25	10/26/86				70	10/26/87		31	11
10/27/85		47	76	28	10/27/86				101	10/27/87		26	19
10/28/85	20	36	69	43	10/28/86				183	10/28/87		14	16
10/29/85		82	102	53	10/29/86	34				10/29/87		9	19
10/30/85		75	51		10/30/86				43	10/30/87	28	23	13
10/31/85		27	81	36	10/31/86				48	10/31/87		19	12
11/01/85		36	53	40	11/01/86				40	11/01/87		10	15
11/02/85		31	63	32	11/02/86				31	11/02/87		10	19
11/03/85	72	49	64	33	11/03/86				31	11/03/87			6
11/04/85		67	96	63	11/04/86	69			40	11/04/87		19	18
11/05/85		46	40	33	11/05/86				71	11/05/87	3	9	9
11/06/85		52	71	31	11/06/86				79	11/06/87			6
11/07/85		53	79	42	11/07/86				53	11/07/87			17
11/08/85		58	90	155	11/08/86				60	11/08/87		100	15
11/09/85		43	76	101	11/09/86				53	11/09/87		29	7
11/10/85		28	47	105	11/10/86	46			77	11/10/87		33	20
11/11/85		5	13		11/11/86				72	11/11/87	33		19
11/12/85			14	5	11/12/86				71	11/12/87		39	26
11/13/85		15	19	9	11/13/86				64	11/13/87		35	21
11/14/85		23	33	15	11/14/86				55	11/14/87		22	15
11/15/85	29	32	30	19	11/15/86				51	11/15/87		23	14
11/16/85		35	41	15	11/16/86	70			44	11/16/87		43	28
11/17/85		28	34	19	11/17/86				40	11/17/87	33	53	23
11/18/85		15	21	14	11/18/86				11	11/18/87		41	17
11/19/85		13	29	18	11/19/86				18	11/19/87		45	18

1985					1986					1987				
Date	Market	ACE-1	ACE-2	ACE-3	Date	Market	ACE-1	ACE-2	ACE-3	Date	Market	ACE-2	ACE-3	
11/20/85		40	62	26	11/20/86		31	20		11/20/87		53	52	
11/21/85	50	36	35	16	11/21/86		65	12		11/21/87		36	13	
11/22/85	32	49	19		11/22/86	29	31	18		11/22/87		58	24	
11/23/85	60	65	36		11/23/86		33	6		11/23/87	38	54	30	
11/24/85	27	44	35		11/24/86		41	17		11/24/87		58	28	
11/25/85	21	20	17		11/25/86		45	12		11/25/87		121	33	
11/26/85	22	28	14		11/26/86		54	29		11/26/87		34	17	
11/27/85	25	17	22	11	11/27/86		63	29		11/27/87		59	35	
11/28/85	10	21	11		11/28/86	71	72	42		11/28/87		56		
11/29/85	4	25	79		11/29/86		69	60		11/29/87	71	46	31	
11/30/85	13	20	9		11/30/86		33			11/30/87		121	70	
12/01/85	19	29	20		12/01/86		69			12/01/87		69	36	
12/02/85	13	17	143		12/02/86		60	44		12/02/87		53	18	
12/03/85	42	12	18	11	12/03/86		104	64		12/03/87		61	37	
12/04/85	26	24	13		12/04/86	108	131	73		12/04/87		56	59	
12/05/85	16	19	13		12/05/86					12/05/87	17		7	
12/06/85	23	31	12		12/06/86		22	18		12/06/87		19		
12/07/85	36	24	21		12/07/86		19	11		12/07/87		14	8	
12/08/85	11	17	9		12/08/86		29	15		12/08/87		19	17	
12/09/85	46	11	27	10	12/09/86		33	21		12/09/87		22	12	
12/10/85	20	27	10		12/10/86	60	31	12		12/10/87			12	
12/11/85	9	42	7		12/11/86		48			12/11/87	42			
12/12/85	23	35	19		12/12/86		53	20		12/12/87				
12/13/85	56		32		12/13/86		40	24		12/13/87				
12/14/85	50	58	24		12/14/86		42	24		12/14/87				
12/15/85	79	57	51	33	12/15/86		41	30		12/15/87				
12/16/85	68	76	54		12/16/86	20	68	48		12/16/87				
12/17/85	65	61	55		12/17/86		55	38		12/17/87				
12/18/85	64	69	43		12/18/86		49	34		12/18/87				
12/19/85	63	52	38		12/19/86		57	46		12/19/87				
12/20/85	33	73	35		12/20/86		20	8		12/20/87				
12/21/85	50	53	53	29	12/21/86		29	19		12/21/87				
12/22/85	66	60	35		12/22/86		50	24		12/22/87				
12/23/85	88	70	57		12/23/86		36	14		12/23/87	6			
12/24/85	85	82	67		12/24/86		38	22		12/24/87				
12/25/85	106	90	55		12/25/86		37	26		12/25/87		15		
12/26/85	89	95	54		12/26/86		65	26		12/26/87		37	19	
12/27/85	78	83	71	47	12/27/86		55	28		12/27/87		36	29	
12/28/85	66	63	47		12/28/86	42	42	25		12/28/87		52	35	
12/29/85	62	86	49		12/29/86		72	57		12/29/87	30	50	24	
12/30/85		20	15		12/30/86		80	40		12/30/87		13	6	
12/31/85	24	28	25		12/31/86		84	44		12/31/87		29	18	
Records:	3119	13772	18822	15135		2362	7278	13584	10409		2436	12713	9832	
Records:	44	342	348	347	Records:	53	248	320	326	Records:	53	323	326	
AnAv:	71	40	54	44	AnAv:	45	29	42	32	AnAv:	46	39	30	

1988				1989				1990							
Date	Market	ACE-2	ACE-3	Date	Market	ACE-2	ACE-3	ACE-5	ACE-6	Date	Market	ACE-2	ACE-3	ACE-5	ACE-6
01/04/88	18	32	20	01/04/89		14	13			01/05/90	84	80		11	12
01/10/88	34	38	32	01/06/89	28					01/11/90	30	82	47	13	20
01/16/88	39	17	18	01/10/89		42	15			01/17/90	9	5	3	3	
01/22/88	42	20	15	01/12/89	16					01/23/90	45	47	27	8	6
01/28/88	90		39	01/16/89	58	65	32			01/29/90	59	80	26	8	9
02/03/88	45	26	18	01/22/89	64	78	42			02/04/90	16	21	15	8	8
02/09/88	61	52	31	01/28/89	47	53	33			02/10/90	63	64	30	8	8
02/15/88	57	4	22	02/03/89	94	36	136	34		02/16/90	102	53	120	31	47
02/21/88	150	4	35	02/09/89	15	8	8	6	5	02/22/90	39	57	22	2	8
02/27/88	26	4	13	02/15/89	34	34	25		8	02/28/90	54	72	39	12	21
03/04/88	30	2	13	02/21/89	39	33	22	5	7	03/06/90	42	57	27	8	15
03/10/88	28	3	15	02/27/89	32	40	30		17	03/12/90	30	30	9	5	6
03/16/88	66	14	23	03/05/89	45	26	20	7	25	03/18/90	64	39		7	9
03/22/88	45	38	25	03/11/89	18	15	24	9	11	03/24/90	38	60	31	17	15
03/28/88	26	32	22	03/17/89	23	17	19	5	11	03/30/90	28	32	26	17	16
04/03/88	33	31		03/23/89	22	21	29	14		04/05/90	20	25	24	17	15
04/09/88	19	26	17	03/29/89	35	17	11	8	8	04/11/90	46	52	30	17	15
04/15/88	4	4		04/04/89	41	42	23	12	17	04/17/90	8	12	13	5	5
04/21/88	12	10		04/10/89	63	42	49	19	32	04/23/90	366	133	178	32	97
04/27/88	35	56	34	04/16/89	26	29	33	24	22	04/29/90	64	31	32	18	26
05/03/88	30	23	27	04/22/89		39	62	27	27	05/05/90	43	29	17		11
05/09/88	10	33	18	04/28/89	21	26	23	13	13	05/11/90	35	44	31	28	29
05/15/88	26	30	28	05/04/89	31		26	20	17	05/17/90	58	60	77	31	30
05/21/88	25	34	20	05/10/89	13	14	38	8	8	05/23/90	43	43	81	17	40
05/27/88	29	27	29	05/16/89	30	21	16	10	10	05/29/90	17	17	16	15	15
06/02/88	31	26		05/22/89	20	33	54	17	19	06/04/90	28	31	39	16	16
06/08/88	19	20	18	05/28/89	51	29	54	17	19	06/10/90	20	20	22	12	12
06/14/88	34	43	33	06/03/89	52	45	48	28	30	06/16/90	28	29	24	21	19
06/20/88	42	35		06/09/89	38	33	48	19	22	06/22/90	38	45	51	27	29
06/26/88	34	36	9	06/15/89	98	56	66	26	24	06/28/90	42		33	23	19
07/02/88	30	39	33	06/21/89	54	54	18	22	23	07/04/90	24		30	15	15
07/08/88	32	36	33	06/27/89	38	32	61	13	15	07/10/90	32		24	18	21
07/20/88	71	48	40	07/03/89	25	34	27	18	21	07/16/90	41		34	37	29
07/26/88	25	34	24	07/09/89	61	43	39	28	28	07/22/90	23	26	29	18	16
08/01/88	52	34	29	07/15/89	44	34	41	19	22	07/28/90	28	34	34	23	21
08/07/88	25	29	26	07/21/89	48	84	49	21	23	08/03/90	41	44	37	29	30
08/13/88	36	26	31	07/27/89	38	48	36	24	23	08/09/90	47		28	21	22
08/19/88	41	57	36	08/02/89	27	34	29	19	23	08/15/90		56	47	40	49
08/25/88	18	20	14	08/08/89	41	69	30	26	23	08/21/90	20	26	23	18	17
08/31/88	49	34	23	08/14/89	25	30	23	17	17	08/27/90	31	31	17	14	13
09/06/88	46	42	33	08/20/89	26	33	32	24		09/02/90	57	30	26	16	16
09/12/88	51	43	22	08/26/89	30	44	31	25	26	09/08/90	41	52	29	23	32
09/18/88	53	54	38	09/01/89	26	38	31	20	20	09/14/90	22	24	27	14	13
09/24/88	32	33		09/07/89		38	51	21	22	09/20/90	23	22	25	10	13
09/30/88	45	35	14	09/12/89	59					09/26/90	25	27	19	16	14
10/06/88	38	36		09/13/89		51	21	10	19	10/02/90	42	39	35	23	24
10/12/88	30	35	33	09/15/89	54					10/08/90	33	34	13	8	8
10/18/88	50	41	19	09/19/89	10	18	5	4	3	10/14/90		55	32		23
10/24/88	63	55	32	09/25/89	46	58	28	9	15	10/20/90	16	14	9	5	7
10/30/88	43	35	21	10/01/89	32	23	23	14	13	10/26/90	70		35	15	
11/05/88	34	42	24	10/07/89		46	21	14	13	11/01/90		21	13	10	9
11/11/88	30	30	18	10/13/89	89	50	31	16	16	11/02/90	29				
11/17/88	70	23	18	10/19/89	54	57	36	16	38	11/07/90	31	34	11	6	10

1988				1989					1990							
Date	Market	ACE-2	ACE-3	Date	Market	ACE-2	ACE-3	ACE-5	ACE-6	Date	Market	ACE-2	ACE-3	ACE-5	ACE-6	
11/23/88	43	44	93	10/25/89	41	26	32	6	8	11/13/90	89	86	35	14	16	
11/29/88	61	54	34	10/31/89	112	63	32	6	16	11/19/90	31			22	26	
12/05/88	77	75	46	11/06/89	66	51	30	24		11/25/90	60					
12/11/88	58	47	23	11/12/89	67	76	34	18	19	12/01/90	60	93	47	13	21	
12/17/88	26	16	11	11/18/89	54	26	14	3	8	12/07/90	69		43	9	11	
12/23/88	24	13	8	11/24/89	89	55	39	23	25	12/13/90	29	37	24	14	17	
12/29/88	47	35	18	11/30/89	77	91	35	9	18	12/19/90	147	109	228	27	63	
	2318	1881	1474	12/06/89	97	98	46	12	31	12/25/90	57	71	41	13	10	
Records:	55	59	58	12/12/89	104	76	64	7	13	12/31/90	74	106	40	11	12	
AnAv:	42	32	25	12/18/89	105	82	61	14			2851	2416	2127	939	1159	
				12/24/89	67	93	56	14	15		Records:	59	51	57	58	59
				12/30/89	49	23	5	7			AnAv:	48	47	37	16	20
					2760	2549	2092	810	942							
					Records:	58	58	59	52	51						
					AnAv:	48	44	35	16	18						

1991					1992			1993				
Date	Market	ACE-2	ACE-3	ACE-5	ACE-3	Date	Athol	Market	ACE-3			
01/06/91	26				01/01/92	18		01/01/93	13	13		
01/12/91	40	44	29	13	16	01/07/92	12	5	01/07/93	16		
01/18/91	49	39	29	6	7	01/13/92	41	21	01/13/93	9	7	
01/24/91	75	98	56	20	13	01/19/92	21	7	01/19/93	15	7	
01/30/91	98	118	60	29	22	01/25/92	54	36	01/25/93	15	42	
02/05/91	114	73	43	11	11	01/31/92	69	53	01/31/93	8	8	
02/11/91	109	138	50	13	17	02/05/92	30		02/03/93		34	
02/17/91	40	52	19	14	14	02/06/92		3	02/06/93	12	13	
02/23/91	40		27	14	12	02/12/92	10	5	02/07/93		24	
03/01/91	47		13	2	2	02/18/92	16	5	02/09/93		11	
03/07/91	82	31	8	5	5	02/24/92	26	14	02/12/93	9	9	
03/13/91	33	16	36	3	25	03/01/92	32	16	02/18/93	12	11	
03/19/91	7	13	24	4	21	03/07/92	14	9	02/24/93	14		
03/25/91	19	29	22	3	8	03/13/92	44	22	03/02/93	11	14	
03/31/91	20	22	15	12	10	03/19/92	32	20	03/08/93	11	51	13
04/06/91	100	57	74	17	64	03/25/92		6	03/14/93	15	19	
04/12/91	39	28	17	15	12	03/31/92	8	3	03/15/93		25	
04/18/91	27	31	23	15	15	04/06/92	28	20	03/20/93	14	30	16
04/24/91	35	24	32	14	21	04/12/92	30	21	03/26/93	3	10	3
04/30/91	51	51	50		28	04/18/92	64	21	04/01/93	16		
05/06/91	46	37	22	20	21	04/24/92	82	26	04/02/93		31	24
05/12/91	25	25	22	16	16	04/30/92		58	04/07/93	14	40	14
05/18/91	21	18	20	10	10	05/08/92	31	44	04/13/93	11	27	12
05/24/91	26	29	34	11	21	05/12/92	28	22	04/19/93	20	39	19
05/30/91	65	45	26	140		05/18/92	30	30	04/25/93	19	24	18
06/05/91	35		39	12	10	05/24/92	26	39	05/01/93	34	46	27
06/11/91	50		37	31	36	05/30/92	89	28	05/07/93	24	37	21
06/17/91	27	35	31	18	20	06/05/92	48	51	05/13/93	23		23
06/23/91	22	28	38	20	19	06/11/92	36	40	05/19/93	28		28
06/29/91	16	11	14			06/17/92	28	24	05/25/93	30	26	37
07/05/91	32		28			06/23/92	38	27	05/31/93	51	41	50
07/11/91	26		27			06/29/92	42	53	06/06/93	13	21	8
07/17/91	27		31			07/05/92	19	24	06/12/93	27	35	27
07/23/91	27		30			07/11/92	22	21	06/18/93	20	54	19
07/29/91	51		24			07/17/92	36	25	06/24/93	22	44	21
08/04/91	23		28			07/23/92	27	7	06/30/93	43	34	37
08/10/91	36		33			07/29/92	29		07/06/93	37	34	36
08/16/91	25		24			08/04/92	38		07/12/93	34		35
08/22/91	42		28			08/10/92	54	32	07/18/93	32		32
08/28/91	26		22			08/16/92	25	26	07/24/93	26	30	28
09/03/91	32		25			08/22/92	33	49	07/30/93	24		26
09/09/91	40		49			08/28/92	44	38	08/05/93	33	47	36
09/15/91	36		22			09/03/92	41	40	08/11/93	48	48	40
09/21/91	23		25			09/09/92	40	30	08/17/93	30	31	25
09/27/91	32		21			09/15/92	28	23	08/23/93	44	39	35
10/03/91	48		26			09/21/92	56	33	08/29/93	26	26	27
10/09/91	67		20			09/27/92	63	26	09/04/93	36	32	44
10/15/91	104		28			10/03/92	24	21	09/10/93	40	56	33
10/21/91	34		25			10/09/92	57	35	09/16/93	45	48	50
10/27/91	27					10/15/92	38	40	09/22/93	45	50	43
11/02/91	43					10/21/92	33	43	09/28/93	27	78	27
11/08/91			38			10/27/92	18	20	10/04/93	41	45	44
11/14/91	91		21			11/02/92	43	26	10/10/93	28	42	28

1991					1992			1993				
Date	Market	ACE-2	ACE-3	ACE-5	Date	Market	ACE-3	Date	Athol	Market	ACE-3	
11/20/91	33	34			11/08/92	37	31	10/16/93	11	9	11	
11/26/91	53	59			11/14/92	48	30	10/22/93	26	75	25	
12/02/91	44				11/20/92	105	20	10/28/93	23	79	25	
12/08/91	6	4			11/26/92	41	24	11/03/93	29	66	27	
12/14/91	44	28			12/02/92	47	48	11/09/93	56	63	53	
12/20/91	45	14			12/08/92	14	9	11/15/93	18	28	19	
12/26/91	46	33			12/14/92	37	14	11/21/93	35		47	
	2466	1117	1673	388	616	12/20/92	28	42	11/24/93		38	
Records:	57	25	56	28	28	12/26/92	27	24	11/27/93	43	46	63
AnAv:	43	45	30	14	22		2179	1530	12/03/93	23	76	31
					Records:	59	58	12/09/93	19	29	27	
					AnAv:	37	26	12/15/93	5	12	8	
								12/21/93	24	48	33	
								12/27/93	39	70	49	
									1466	1981	1567	
								Records:	57	52	59	
								AnAv:	26	38	27	

1994			1995		
Date	Athol	Market ACE-3	Date	Athol	ACE-3
01/02/94	38	42	01/03/95	9	9
01/08/94	49	51	01/09/95	6	6
01/14/94	76	76	01/15/95	11	6
01/20/94	52	76	01/21/95	8	7
01/26/94	6	14	01/27/95	14	7
02/01/94	33	49	02/02/95	26	20
02/07/94	9	8	02/08/95	16	13
02/13/94	18	24	02/14/95	7	7
02/19/94	8		02/20/95	21	20
02/25/94	21		02/26/95	15	15
03/03/94	18		03/04/95	13	11
03/09/94	15		03/10/95	17	18
03/15/94	23		03/16/95	14	15
03/21/94	23		03/22/95	17	20
03/27/94	14		03/28/95	10	12
04/02/94	19		04/03/95	15	16
04/08/94	51		04/09/95	21	21
04/14/94	29		04/15/95	23	22
04/20/94	28		04/21/95	9	10
04/26/94	5		04/27/95	48	54
05/02/94	27		05/03/95		15
05/08/94	6		05/09/95		24
05/14/94	31		05/15/95		10
05/20/94	12		05/21/95		37
05/26/94	32		05/27/95		
06/01/94	22		06/02/95		23
06/07/94	21		06/08/95		12
06/13/94	23		06/14/95		36
06/19/94	25		06/20/95		18
06/25/94	35		06/26/95		19
07/01/94	38		07/02/95		13
07/07/94	31		07/08/95		20
07/13/94	28		07/14/95		21
07/19/94	46		07/20/95		23
07/25/94			07/26/95		28
07/31/94	25		08/01/95		49
08/06/94	25		08/07/95		25
08/12/94	38		08/13/95		24
08/18/94	36		08/19/95		21
08/24/94	28		08/25/95		24
08/30/94	33		08/31/95		23
09/05/94	33		09/06/95		20
09/11/94	41		09/12/95		25
09/17/94	33		09/18/95		26
09/23/94	31		09/24/95		18
09/29/94	34		09/30/95		18
10/05/94	12	3		800	489
10/11/94	21		Records:	41	28
10/17/94	24	5	AnAv:	20	17
10/23/94	27	22			
10/29/94	55	26			
11/04/94	20	17			
11/10/94	6	6			

1994			1995			
Date	Athol	Market	ACE-3	Date	Athol	ACE-3
11/16/94	22		22			
11/22/94	23		18			
11/28/94	31		25			
12/04/94	19		18			
12/10/94	39		35			
12/16/94	28		23			
12/22/94	107		89			
12/28/94	22		21			
	1725	340	1458			
Records:	60	8	55			
AnAv:	29	43	27			

Appendix B

Emission Inventories

Introduction

Presentation Format

Stationary Sources

Area Sources

On-Road Sources

Summary, Forecast and Growth Codes

I. Introduction

This appendix presents the 1990 PM₁₀ emission inventory for the San Bernardino County portion of the Searles Valley Planning Area (the Trona region). This appendix also includes actual 1991, 1992, 1993 and 1994 data for all stationary sources in the Trona region. This appendix also includes forecasted 1997, 200, and 2010 emission inventories (forecasted by summary category). These inventories serve as the basis for each emission inventory presented. 1990 serves as the overall baseyear for planning and forecasting purposes. The inventories tabulate PM₁₀ emissions in tons per year (tpy) and tons per day (tpd). This appendix concludes with a summary of the data for each year, as well as the projected year inventories.

II. Presentation Format

Sources are presented in three groups: stationary sources, area sources, and on-road sources. Within each group, sources are organized by category based on industry or activity type. PM₁₀ emissions are totaled for each facility and category in tons per year, and for each category in tons per day in 1990. Standard Industrial Classification (SIC) codes, Source Classification Codes (SCC), and Emission Inventory Code (EIC) numbers are given for each category where known. These codes and numbers attempt to identify industry, activity and process, and may not accurately represent each facility. The emission data is presented individually in tabular format with category totals. Italicized values have been estimated or interpolated by the MDAQMD to account for missing data. '---' indicates a facility or process that did not operate.

III. Emission Source Groups

Stationary Sources

For the purposes of this document, Stationary Sources are typically large-scale, fixed facilities or operations with significant District-permitted equipment. Each District facility submits an annual criteria inventory that details emissions, activity rates and emission factors. These criteria emission inventory submissions were the primary data and methodology source used for stationary sources. Source test data was used where available to estimate emissions; otherwise the best available emission factors were used.

Electric Utility and Electricity Generation Facilities

1990: 0.03 tpd

SIC 4911 (Electric Services)

SCC 1-01-002-17 (Industrial Coal-Fired Fluidized Bed Generator)

	1990	1991	1992	1993	1994 (tpy)
Ace Cogeneration Company/Argus					
Coal-Fired Boiler	9.13	16.09	16.58	12.68	15.48
Boiler on NG	0.00	0.00	0.03	0.04	0.02
Coal Barn	0.01	0.03	0.00	0.00	0.00
Coal Silos	0.00	0.01	0.01	0.01	0.02
Limestone Handling	0.02	0.00	0.01	0.01	0.01
Bottom and Fly Ash Silos	0.05	0.14	0.14	0.13	0.14
Cooling Tower	1.67	4.90	4.90	4.56	4.95
Fire Pump	0.00	0.00	0.01	0.00	0.01
Emergency Generator	0.00	0.00	0.01	0.01	0.00
Diesel Vehicles	0.01	0.02	0.04	0.06	0.07
Category Totals (tpy):	10.89	21.19	21.70	17.50	20.70

Landfills

1990: 0.03 tpd

SIC 4953 (Sanitary Landfill Operation)

	1990	1991	1992	1993	1994 (tpy)
Trona-Argus/Trona					
Unpaved Road Travel	3.02				
Working Face	0.11				
Delivery Vehicle Exhaust	0.01				
Diesel Equipment Exhaust	0.83				
Wind Erosion	8.00				
Category Totals (tpy):	11.97	11.97	11.97	11.97	11.97

Military Bases

1990: 0.00 tpd

SIC 9711 (National Security Administration)

1990 1991 1992 1993 1994 (tpy)

China Lake Naval Air Weapons Station

Data not tabulated

China Lake Naval Air Weapons Station - South Range

Data not tabulated

Category Totals (tpy): **0.00** **0.00** **0.00** **0.00** **0.00**

Mineral Mining

1990: 8.56 tpd

SIC 1499 (Miscellaneous Non-Metallic Mineral Mining)

SIC 3295 (Ground or Treated Minerals Manufacturing)

	1990	1991	1992	1993	1994 (tpy)
North American Chemical Company/#79 - Argus					
Bleacher Feed Bin #1	3.58	4.03	2.62	2.58	12.06
Mono Crystallizer #1	7.17	8.06	8.03	8.20	7.64
Mono Dryer #1	17.67	19.87	10.39	11.57	10.25
Bleacher Feed Bin #2	9.76	10.60	2.70	2.79	0.67
Mono Crystallizer #2	5.00	5.43	4.12	3.78	0.56
Mono Dryer #2	13.69	15.44	4.48	4.20	1.39
Bleacher Feed Bin #3	11.31	12.43	3.33	3.25	1.19
Mono Crystallizer #3	5.69	6.25	3.50	3.28	4.85
Mono Dryer #3	23.12	25.40	12.53	11.75	7.88
Bleacher ESP	76.69	84.59	22.05	17.59	13.82
Screening Plant	2.78	3.07	4.57	4.75	3.51
MEA System	17.32	19.10	17.58	16.84	32.44
A-Frame	3.98	4.39	4.57	4.60	6.02
Soda Ash Truck Load	0.91	0.76	0.84	1.94	2.05
Rail Load East Blue	0.40	0.85	0.25	0.13	0.21
Rail Load West Blue	0.40	0.00	0.09	0.05	0.08
Rail Load East Gray	0.28	0.38	0.18	0.09	0.15
Rail Load West Gray	0.17	0.23	3.04	1.53	2.56
Boiler #25	133.90	57.26	68.41	66.77	63.08
Boiler #26	27.18	28.72	47.43	25.30	46.09
Cooling Tower, Argus	51.24	52.18	33.72	36.77	33.35
Coal Stockout	3.64	3.64	2.53	3.64	3.70
Coal Reclaim System	0.87	0.87	0.41	0.87	0.92
Coal Emergency Stock	0.01	0.01	0.01	0.01	0.02
Process Fugitives	25.91	25.91	25.91	25.91	13.30

Railcar Coal Unloading	0.05	0.02	0.02	0.01	0.10
Material Transfer	0.26	0.12	0.13	0.01	
Wind Erosion	9.67	9.67	9.67	9.67	5.48
Road Dust	358.58	146.55	264.00	201.64	141.43
Stationary Equipment	0.22	0.18	0.19	0.18	
Mobile Equipment Exhaust	1.34	1.14	1.18	0.62	1.40
Totals:	812.79	547.15	558.48	470.32	416.20

North American Chemical Company/#2 - Trona

Supo Dryer	44.30	53.20	2.03	2.02	1.69
Potash Dryer #1	17.55	17.03	1.44	1.47	0.74
Potash Dryer #2	14.48	27.09	23.18	24.80	24.20
Agra Plant	5.91	7.45	6.38	6.36	7.59
Pyro Furnace 2&3	51.76	28.15	8.28	1.79	0.91
Pyro Milling/Screening	.43	7.35	6.38	1.06	0.75
Pyro Storage Silos	0.11	0.11	0.11	0.11	0.08
Borax Dryers 1&2	0.56	0.60	1.32	0.70	0.19
Borax Screening	1.85	1.11	4.34	2.02	0.00
Boric Acid Dryer	1.55	1.53	1.63	0.66	0.43
Carbon Regeneration	0.17	0.54	0.58	0.35	0.34
Boric Oxide Plant	0.00	0.00	0.00	0.09	0.14
Cooling Tower #14	14.29	14.29	25.70	28.55	24.86
Consolidated Bagging	0.00	0.00	0.00	0.16	1.09
Borax Bulk Loadout	0.10	0.18	0.21	0.13	0.16
Borax Elevator	0.10	0.16	0.20	0.15	0.18
Pyrobor Bulk Loadout	0.33	0.36	0.27	0.22	0.13
Potash Bulk Loadout	0.69	0.63	0.64	17.11	16.24
Boric Acid Loadout	0.22	0.06	0.07	0.06	0.00
BAX Tank Inload	0.00	0.02	0.02	0.42	0.01
BAX Tank Outload	0.00	0.02	0.02	0.01	0.01
Soda Ash Storage	0.00	0.00	0.11	0.03	0.00
Multiproduct Loadout	0.01	0.31	2.91	0.38	0.00
Mobile Conveyor	0.03	0.03	0.03	0.03	0.05
Potash BOB	1.30	1.30	1.30	1.30	0.00
Boiler #22	0.52	1.12	0.78	0.70	0.42
Diesel, Boiler #22 Fan	0.01	0.01	0.01	0.01	0.01
Emergency Generator	0.01	0.01	0.01	0.01	0.01
Process Fugitives	7.75	8.29	8.27	8.34	39.50
Wind Erosion	95.33	95.33	95.33	95.33	50.84
Road Dust	859.32	1325	561.71	445.43	329.51
Stationary Equipment	0.16	0.15	0.15	0.07	
Mobile Equipment Exhaust	2.01	2.59	2.28	1.37	1.10
Totals:	1126	1594	755.69	641.24	501.18

North American Chemical Company/#7 - West End

Sulfate Dryer #1	5.82	4.55	2.95	3.04	4.98
Sulfate Dryer #2	8.61	6.82	7.14	2.67	4.93

Sulfate Screening	12.16	9.57	11.60	11.94	0.00
Borax Dryer	5.69	5.10	7.28	1.57	1.85
Borax Conveyors				0.21	0.26
Borax Screening	3.44	3.08	4.40	6.95	0.52
Pyro Furnace #1	5.75	4.52	1.04	0.88	0.00
Pyro Furnace #2	8.40	6.82	6.38	5.16	1.76
Pyro Furnace #3	1.35	1.03	4.89	3.83	3.33
Pyro Nuisance				1.77	1.08
Pyro Conveyor/Screen			0.07	0.54	0.39
Pyro Corning Bin			0.03	0.03	0.02
Pyro Regular Bin			0.04	0.02	0.02
Sulfate Ship Screen	0.94	0.75	0.89	1.55	0.64
Sulfate Sacking	0.06	0.06	0.06	0.03	0.00
Sulfate Loadout	0.89	1.01	0.82	1.00	0.44
Borax Sacking	0.04	0.05	0.18	0.19	0.32
Borax Loadout	0.05	0.06	0.05	0.06	0.58
Pyro Loadout	0.10	0.10	0.08	0.05	0.07
Boiler #1	0.60	0.46	0.26	0.45	0.55
Boiler #3	0.02	0.07	0.02	0.06	0.11
Gas Turbine	13.29	13.96	13.03	13.83	14.72
Borax Cooling Tower	4.02	4.02	1.68	7.30	3.48
Sulfate Cooling Tower #1				1.75	0.21
Sulfate Cooling Tower #2				1.31	0.60
Sulfate Cooling Tower #3				1.47	0.38
Sulfate Cooling Tower #4				1.41	0.30
Sulfate Cooling Tower #5				1.55	0.43
Sulfate Cooling Tower #6				1.37	0.51
Sulfate CT #2 OS				0.35	
Sulfate CT #3 OS				0.42	
Sulfate CT #4 OS				0.51	
Mobile Conveyor 3422	0.25	0.25	0.25	0.25	0.24
Mobile Conveyor 3423	0.22	0.22	0.22	0.02	0.02
Lake Diesel	0.07	0.07	0.07	0.09	0.00
Process Fugitives	9.34	8.98	9.19	9.04	31.90
Wind Erosion	13.95	13.95	9.67	17.71	9.44
Road Dust	330.63	75.53	139.30	278.61	242.03
Stationary Equipment	0.16	0.10	0.08	0.02	
Mobile Equipment Exhaust	1.58	1.10	1.27	1.20	0.80
Totals:	427.43	162.23	222.94	380.21	331.89

North American Chemical Company/Lake Operations

Material Transfer	0.00	0.54	0.54	0.31	20.10
Wind Erosion	28.18	29.18	52.16	52.16	50.08
Salt Harvesting	6.53	6.53	6.53	0.28	
Road Dust	719.54	200.24	223.56	420.20	363.64
Stationary Equipment	0.21	0.68	0.68	0.20	

Mobile Equipment Exhaust	2.16	2.08	1.81	4.83	5.10
Totals:	756.62	239.25	285.28	477.98	438.92

H.M. Holloway Gypsum/Lost Hills (2k tput)

Batch Plant			0.01	0.01
Diesel Generator			0.01	0.01
Totals:	0.02	0.02	0.02	0.02
Category Totals (tpy):	3122.86	1822.41	1969.77	1688.21
		2542.65		

Area Sources

For the purposes of this document, area sources are typically composed of many individually small but collectively significant sources. PM₁₀ emissions in tons per year are estimated for each category. 1990 activity rate, PM emission factor, and the fraction of PM emitted as PM₁₀ are also presented for each category. In addition, if similar activities occurred within the unclassified area, SVPA and/or the PVV the activity rate for those areas is presented. Population and geographic area fractions are used as disaggregation surrogates. Most categories are disaggregated from the MDAQMD total. SVPA disaggregation fractions are population 1.1% and geographic area 3%. "Methods for Assessing Area Source Emissions in California," CARB September 1991, is the primary area source methodology reference. Details on each category's emissions estimation method are presented as appropriate.

	PM ₁₀ (tpy)
47308/9309300200 Wildfires - Grass and Woodland 16 acres burned at 33.6 # PM/acre burned (0.88 PM ₁₀ fraction)	0.24
CARB methodology. Activity data from California Department of Forestry and United States Forest Service; last updated 1989. PM emission factor from Joshua Tree National Monument study. Geographic disaggregation.	
 47316/ Wildfires - Timber & Brush 47 acres burned at 630 # PM/acre burned (0.88 PM ₁₀ fraction)	13.03
CARB methodology. Activity data from California Department of Forestry and United States Forest Service; last updated 1989. Emission factor from AP-42. Geographic disaggregation	
 82115/6106000230 Wood-Burning Stoves 48 tons burned at 31.1 # PM/ton burned (0.92 PM ₁₀ fraction)	0.69
 82123/6106020230 Wood-Burning Fireplaces 187 tons burned at 34.6 # PM/ton burned (0.92 PM ₁₀ fraction)	2.98
CARB methodology. Activity from California Energy Commission fuels report; last updated 1991. Emission factor from AP-42. Population disaggregation.	
 47365/6306245400 Commercial Construction 19 acre-months at 2400 # PM/acre-month (0.64 PM ₁₀ fraction)	14.59
 47373/6306265400 Industrial Construction 22 acre-months at 2400 # PM/acre-month (0.64 PM ₁₀ fraction)	16.90

CARB methodology, assuming 3.7 acres disturbed per million dollars of new commercial valuation (4 acres/\$million for industrial, and 4.4 acres/\$million for institutional/governmental). Also assumes each acre is disturbed for eleven months. Local 1991 construction valuation data used as activity data. Emission factor from AP-42. Population disaggregation.

47357/6306225400 Residential Construction

27 acre-months at 2400 # PM/acre-month (0.64 PM₁₀ fraction) 20.74

CARB methodology, assuming each single family living unit disturbs 0.2 acre, and each multiple family living unit 0.05 acre, at six months of construction per disturbed acre. Local 1991 housing unit construction data used as activity data. Emission factor from AP-42. Population disaggregation.

47399/6406385400 City & County Unpaved Road Dust

San Bernardino County Unmainted Unpaved Roads
110,000 vmt at 6968 # PM/1000 vmt (0.36 PM₁₀ fraction) 137.97

Used AP-42 unpaved road travel equation and San Bernardino County unmaintained unpaved road data from 1994. Determined 3.18 miles of San Bernardino County unmaintained roads, average 95 trips per mile of road per day, 15% silt content on road surface, 30 mph average vehicle speed, 20 days with precipitation greater than or equal to 0.01 inch, and three ton vehicles with four wheels.

47423/6406445400 BLM Unpaved Road Travel Dust

Casual Route Use
39,000 vmt at 3942 # PM/1000 vmt (0.36 PM₁₀ fraction) 27.67

Used AP-42 unpaved road travel equation with BLM activity and casual use area data from 1994. Assumed casual vehicle use was spread evenly over non-wilderness and non-OHV areas at 350 vmt per square mile per year (half of the activity in busier, less remote areas). Equation inputs are average vehicle speed of 20 mph, silt content of 15%, 15 days with precipitation \geq 0.01 inches, mean vehicle weight of 2.5 tons, and vehicles with 3.6 average wheels. Approximately 111 square miles open to casual route use (assumes no casual vehicle use in wilderness, critical or other closed areas, and does not include OHV area use).

Organized Off-Road Event Travel

192,000 motorcycle vmt at 1251 # PM/1000 vmt (0.36 PM ₁₀ fraction)	43.23
8,000 four wheel vmt at 11785 # PM/1000 vmt (0.36 PM ₁₀ fraction)	16.97

Used AP-42 unpaved road travel equation with BLM permit records. BLM estimated an average of 24 motorcycle events and 1 four-wheel drive event at Spangler Hills, with 300 participants (100 participants in four wheel event) covering 80 miles at 50 mph. Other

equation inputs were silt content of 15%, 20 wet days, four wheels (two wheels for motorcycles), and three tons (0.2 ton for motorcycles). Spangler Hills OHV Area covers 202 square miles.

Trona Pinnacles Filming Activity

? vmt at 3326 # PM/1000 vmt (0.36 PM₁₀ fraction)
? acre-days at 11.5 # PM/acre-day (0.5 PM₁₀ fraction)

Used AP-42 unpaved road travel equation with BLM activity records and estimates for Trona Pinnacles filming activity. Estimated events per year, with an average of 35 vehicles (of mixed types) covering 100 miles per event. Assumed average five wheels, five tons, 20 mph, silt content of 15%, and 20 wet days. Also estimated three days of filming on five acres per event, averaging ? acre-days of disturbance per year. Disturbance emissions were estimated using USDA agricultural wind erosion equation, with assumptions identical to those used for unpaved road activity.

47597/8208201210 Locomotive Line Haul Exhaust

934,000 gal at 15.47 # PM/1000 gal burned (0.96 PM₁₀ fraction) 6.94

CARB methodology, obtained from Booz-Allen & Hamilton California locomotive activity report, August 1992. This report used specific engine emission factors obtained from manufacturers & source tests and railroad locomotive activity records.

47324/ Structural Fires

4 fires at 21.11 # PM/fire (0.98 PM₁₀ fraction) 0.04

57307/ Automobile Fires

4 auto fires at 17 # PM/fire (0.997 PM₁₀ fraction) 0.03

CARB methodology, using AP-42 emission factors for municipal refuse (assuming 1.95 tons burned per fire) and automobile components. Activity data obtained from California Fire Incident Reporting System, last updated in 1990. Population disaggregation.

54379/ Light Duty Diesel Mobile Equipment

18,000 gal at 26.24 # PM/1000 gal burned (0.96 PM₁₀ fraction) 0.23

54387/ Light Duty Gasoline Mobile Equipment Exhaust

4,000 gal at 1.4 # PM/1000 gal burned (0.994 PM₁₀ fraction) 0.00

54429/ Light Duty LPG Mobile Equipment Exhaust

5,000 gallons at 1.5 # PM/1000 gallons burned (1.0 PM₁₀ fraction) 0.00

CARB methodology using AP-42 emission factors. Light duty is defined as less than 175 horsepower. Activity data estimated for 1990 using Power System Research load factors and annual hours of operation. Population disaggregation.

/ Wind Erosion Disturbed Areas (Populated)

210 disturbed acres at 2352 # PM/acre (0.5 PM₁₀ fraction) 123.48

Used USDA wind erosion equation, assuming a suspension factor of 0.025, climatic factor of 2.0, and erodibility of 86. Activity estimate includes cleared undeveloped properties and developed single family residential lots with little or no landscaping.

83352/ Wind Erosion Unpaved Roads

14 unpaved road acres at 4183 # PM/acre (0.5 PM₁₀ fraction) 14.64

CARB methodology using USDA wind erosion equation, assuming a suspension factor of 0.038, climatic factor of 2.0, and erodibility of 86. 5 miles of unmaintained unpaved road, assumed average width of 12 feet (7 acres). 3 miles of non-maintained San Bernardino County unpaved roads, assumed average width of 20 feet (7 acres).

83337/ Wind Erosion Agricultural Lands

Wind Erosion BLM Sheep and Cattle Grazing Allotments

Ridgecrest Resource Area

11 acres disturbed at 2352 # PM/acre (0.5 PM₁₀ fraction) 6.47

Used USDA wind erosion equation, with identical assumptions to Agricultural Lands. Cattle are assumed to graze approximately 100 acres per head, disturbing 1% of each acre over two months. Sheep are assumed to graze approximately 20 acres per head, also disturbing 1% of each acre over two months. Ridgecrest Resource Area has 199 square miles of grazing allotments, some inactive due to tortoise (35 square miles in the SVPA).

47464/ Off-Road Motorcycle Exhaust (Trail Bikes)

6,000 gal at 1.14 # PM/1000 gal burned (0.994 PM₁₀ fraction) 0.00

83477/ Off-Road All Terrain Vehicle Exhaust

7,000 gal at 0.9 # PM/1000 gal burned (0.994 PM₁₀ fraction) 0.00

CARB methodology using Booz-Allen & Hamilton and CARB emission factors, and activity information derived from the Motorcycle Industry Council and DMV data. Population disaggregation.

47142/ Industrial Natural Gas Combustion		
4 mmcuft at 10 # PM/mmcuft burned (1.0 PM ₁₀ fraction)		0.02
Emissions estimated using utility-reported industrial natural gas consumption. Emission factor source unknown. Population disaggregation.		
47167/ Commercial/Institutional Unspecified Natural Gas Combustion		
4 mmcuft at 19 # PM/mmcuft burned (1.0 PM ₁₀ fraction)		0.04
58735/ Commercial/Institutional Natural Gas Space Heating		
2 mmcuft at 19 # PM/mmcuft burned (1.0 PM ₁₀ fraction)		0.02
58743/ Commercial/Institutional Natural Gas Water Heating		
1 mmcuft at 19 # PM/mmcuft burned (1.0 PM ₁₀ fraction)		0.01
Emissions estimated assuming utility-reported commercial/institutional natural gas consumption could be allocated as follows: 57% unspecified, 31% space heating, and 12% water heating. Emission factor source unknown. Population disaggregation.		
58727/ Commercial/Institutional LPG Combustion		
2,000 gal burned at 10 # PM/1000 gal burned (1.0 PM ₁₀ fraction)		0.01
47217/6109950120 Residential LPG Combustion		
40,000 gal at 0.28 # PM/1000 gallons burned (1.0 PM ₁₀ fraction)		0.01
CARB methodology. Uses AP-42 emission factor and activity data (propane sales data) gathered from local propane suppliers. Activity data last updated 1994. Population disaggregation.		
54353/8608841210 Mobile Diesel Refrigerators		
99,000 hp-hr at 1.76 # PM/1000 hp-hr (0.96 PM ₁₀ fraction)		0.08
CARB methodology, using emission factors and activity data from Booz-Allen & Hamilton study, last updated 1992. Population disaggregation.		
47191/6109950110 Residential Natural Gas Combustion		
1 mmcuft at 3 # PM/mmcuft burned (1.0 PM ₁₀ fraction)		0.00
54569/6106060110 Residential Natural Gas Space Heating		
6 mmcuft at 3 # PM/mmcuft burned (1.0 PM ₁₀ fraction)		0.01

54577/6106080110 Residential Natural Gas Water Heating		
5 mmcuft at 3 # PM/mmcuft burned (1.0 PM ₁₀ fraction)		0.01
54585/6106100110 Residential Natural Gas Cooking		
1 mmcuft at 3 # PM/mmcuft burned (1.0 PM ₁₀ fraction)		0.00
CARB methodology using AP-42 and American Gas Association emission factors, assuming natural gas sales reported by utilities can be allocated as follows: 47% to space heating, 43% to water heating, 6% to cooking, and 4% to unspecified. Utility sales data last updated in 1991. Population disaggregation.		
47456/6406365400 Paved Road Travel Dust Entrainment		
22 million vmt at 10330 # PM/million vmt (0.46 PM ₁₀ fraction)		52.27
CARB methodology using District activity data and AP-42 paved road emission equation. Assumes 45% of vmt occurs on freeways, 38% on major streets, 10% on collector streets, and 8% on local roads. Activity data is estimated by SCAG for entire District using transportation modeling. Latest modeling was performed in 1994. 1.09% of MDAQMD on-road activity is allocated to SVPA.		
47266/6706680200 Tumbleweed Clearing/Burning Fires		
173 tons at 33.6 # PM/ton burned (0.88 PM ₁₀ fraction)		2.56
47282/6706640200 Range Improvement Fires		
3 tons at 33.6 # PM/ton burned (0.88 PM ₁₀ fraction)		0.04
Emissions estimated using District activity data and CARB brushfire emission factors. Assumes 15 tons/acre loading factor, and uses District and San Bernardino County open burning permits to estimate number of fires and average area cleared. Activity data last updated with 1991 information. Population disaggregation.		
54411/8508761100 Recreational Four-Wheel Drives		
8,000 gal at 8.2 # PM/1000 gal burned (0.994 PM ₁₀ fraction)		0.03
CARB methodology using activity data from DMV records and emission factors from Booz-Allen & Hamilton off-road mobile equipment study. Last updated with 1990 data. Population disaggregation.		
82164/8608821100 Heavy Duty Gasoline Mobile Equipment		
15,000 gallons at 0.18 # PM/1000 gal burned (0.994 PM ₁₀ fraction)		0.00

83097/8608821210 Heavy Duty Diesel Mobile Equipment
1,014,000 gal at 1.37 # PM/1000 gal burned (0.994 PM₁₀ fraction)

0.69

CARB methodology using activity data from Power System Research and emission factors from Booz-Allen & Hamilton off-road mobile equipment study. Heavy duty equipment is defined as greater than 175 horsepower. Last updated with 1990 data. Population disaggregation.

On-Road Mobile Source Exhaust and Tire Wear

These emissions estimates include exhaust and tire wear PM₁₀ emissions for vehicular travel on paved roads; dust entrainment from vehicular travel on paved roads is described as an area source.

	1990
Light Duty Passenger Vehicles	
1540 veh, 8161 daily trips, 86775 daily miles (0.46 PM ₁₀ fraction)	0.01
Light Duty Trucks	
431 veh, 1674 daily trips, 24285 daily miles (0.46 PM ₁₀ fraction)	0.00
Medium Duty Trucks	
138 vehicles, 533 daily trips, 7804 daily miles (0.47 PM ₁₀ fraction)	0.00
Heavy Duty Gasoline Trucks	
58 vehicles, 1512 daily trips, 7314 daily miles (0.50 PM ₁₀ fraction)	0.00
Heavy Duty Diesel Trucks	
20 vehicles, 10529 daily miles (0.87 PM ₁₀ fraction)	0.04
Motorcycles	
69 vehicles, 52 daily trips, 480 daily miles (1.0 PM ₁₀ fraction)	0.00
Category Totals (tpd)	0.06
Category Totals (tpy)	20.61

On road mobile source exhaust and tire wear emissions were calculated using two modeling systems: DTIM (SCAG) and BURDEN (CARB). The DTIM system generates vehicle activity (trips and miles traveled) using socioeconomic data (population and land uses). DTIM assumes average trip generation rates for each land use, and multiplies them by population. These trips are then allocated by a demand algorithm to establish trip lengths. The DTIM model did not cover the entire District; its coverage of the Victor Valley was extrapolated out over the remainder of the District. This trip information was validated using actual Caltrans Highway Performance Monitoring System vehicle counts on major arterials and highways. The BURDEN system uses county-specific Department of Motor Vehicles vehicle population information, Caltrans heavy duty vehicle data, and EMFAC7F emission factors to calculate emissions specific to vehicle classes. This inventory was derived from BURDEN runs made on 9/9/94 and 9/12/94.

SVPA data was determined as a fraction of the District-wide data, using the SVPA fraction of the District population as the proportion (1.09 percent).

Summary, Forecast and Growth Code Information

(all emissions in tons per year)

	Growth	1990	1991	1992	1993	1994	1997	2000	2010
Electric Generation	electric	10.89	21.19	21.70	17.50	17.50	22.00	22.00	22.00
Landfill	none	11.97	11.97	11.97	11.97	11.97	11.97	11.97	11.97
Mineral Mining	mining	3122.86	2542.65	1822.41	1969.77	1688.21	1561.43	1592.66	1592.66
Total Stationary:		3145.72	2575.81	1856.08	1999.24	1717.68	1595.40	1626.63	1626.63
Unplanned Fires	none	13.34	13.34	13.34	13.34	13.34	13.34	13.34	13.34
Wood Combustion	HU	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67
Construction	const	52.23	52.23	52.23	52.23	41.78	41.78	41.78	41.78
Unpaved Road Travel	none	137.97	137.97	137.97	137.97	137.97	137.97	137.97	137.97
Activity on BLM Lands	BLM	87.87	87.87	87.87	87.87	70.30	70.30	70.30	70.30
Locomotive Exhaust	rail	6.94	6.94	6.87	6.87	6.80	6.73	6.66	6.66
Light Duty Equipment	emp	0.23	0.23	0.23	0.24	0.24	0.25	0.25	0.28
Wind Erosion Disturbed Areas	dist	123.48	123.48	123.48	123.48	123.48	86.44	86.44	86.44
Wind Erosion Unpaved Roads	none	14.64	14.64	14.64	14.64	14.64	14.64	14.64	14.64
Wind Erosion Grazing	none	6.47	6.47	6.47	6.47	6.47	6.47	6.47	6.47
Industrial NG Combustion	emp	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Commercial NG Combustion	emp	0.07	0.07	0.07	0.07	0.07	0.07	0.08	0.08
LPG Combustion	emp	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Diesel Refrigerators	emp	0.08	0.08	0.08	0.08	0.08	0.09	0.09	0.10
Residential NG Combustion	HU	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Paved Road Dust	vmt	52.27	52.79	53.32	53.84	54.36	55.93	57.50	62.72
Weed Suppression Fires	none	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60
Four Wheel Drive Exhaust	none	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Heavy Duty Diesel Equipment	emp	0.69	0.70	0.70	0.71	0.72	0.74	0.76	0.83
Total Area:		502.64	503.17	503.64	504.17	476.62	441.10	442.64	447.97
On Road Mobile Sources	on road	20.61	20.20	19.58	19.17	18.55	17.52	17.52	21.85
Total SVPA:		3668.97	3099.18	2379.30	2522.58	2212.85	2054.02	2086.78	2096.45
	Growth Codes	1990	1991	1992	1993	1994	1997	2000	2010
Construction	const	1.00	1.00	1.00	1.00	0.80	0.80	0.80	0.80
Electric Generation	electric	1.00	2.02	1.99	1.61	2.02	2.02	2.02	2.02
Employment	emp	1.00	1.01	1.02	1.03	1.04	1.07	1.10	1.20
Housing Units	HU	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Population	pop	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Railroad Activity	rail	1.00	1.00	0.99	0.99	0.98	0.97	0.96	0.96
Disturbed Area Wind Erosion	dist	1.00	1.00	1.00	1.00	1.00	0.70	0.70	0.70
Bureau of Land Management	BLM	1.00	1.00	1.00	1.00	0.80	0.80	0.80	0.80
On Road VMT	vmt	1.00	1.01	1.02	1.03	1.04	1.07	1.10	1.20
Mining Activity	mining	1.00	1.00	1.00	1.00	0.55	0.50	0.51	0.51
On Road Exhaust	on road	1.00	0.98	0.95	0.93	0.90	0.85	0.85	1.06

Appendix C

Implementation Documentation

Dust Control Plans

Ace Cogeneration Company

NACC

Naval Air Weapons Station China Lake

BLM Commitment Letter (October 6, 1994)

NACC Street Sweeping Records (examples)

July-August 1994

October/November 1995

Ace Cogeneration Company Ash Cleanup Log

MDAQMD Treatment Report



January 6, 1995

Christian N. Thenacho
Supervising Air Quality Planner
Mojave Desert AQMD
15428 Civic Drive, Suite 200
Victorville, CA 92392

RE: Dust Control Plan

Dear Mr. Thenacho:

Pursuant to a general notice by the District dated December 19, 1994, A/C Power - ACE Operations, on behalf of the ACE Cogeneration Company, herewith submits our previously approved Dust Control Plan per the District's new standard format.

For the record, A/C Power submitted a Dust Control Plan to the District on August 22, 1994. Additional facility background information, as requested by the District, was submitted on August 31, 1994, and final approval of the plan was received on October 27, 1994.

The purpose of this plan is to comply with District Rule 403.1 for respirable particulate matter (PM10), and to assist in the federal PM10 attainment process for the Searies Valley Planning Area.

The ACE Cogeneration Facility is currently operating at full load and plans are to continue with the present operating levels through 2010. However, A/C Power is committed to implementing this plan should any construction activity result in disturbed surface areas on ACE property.

If you have any questions please do not hesitate to call Mr. Z. M. Waller at Ext. 2073.

Sincerely,

John R. Zamlen
Plant Manager

ACE Cogeneration Company

- Dust Control Plan -

Pursuant to Rule 403.1 for Respirable Particulate Matter (PM10), the following is a Dust Control Plan for construction or demolition activities at the ACE Cogeneration Facility. This plan adheres to the standard format outline in the District's December 19, 1994 letter:

I. Cover Letter

A statement of purpose and commitment is addressed in the cover letter attached hereto.

II. Affected Facility/Activity Description

A. Location

The ACE Cogeneration Facility is located at 12801 Mariposa Street, Trona, CA 93562.

B. Size

The ACE property consists of approximately 81 acres. Of that acreage only about 5-8 acres are occupied by the boiler facility and support equipment and buildings.

Approximately 65 acres of the facility property are occupied by the existing ash disposal site. Of that acreage approximately 21 acres are currently in use. Plans are to develop the remaining 44 acres over the life of the project. Development of the ash site has been approved by, and is monitored by, the CEC, Lahontan Water Board, San Bernardino County DEHS, and San Bernardino County Office of Building & Safety.

C. Type of Features

The boiler facility is located on flat terrain. The private road network within the facility is an asphalt loop of approximately 1 mile in total length from the main gate around the plant and back to the main gate (see map). The public road stops and begins at the main gate.

The Administration Building main parking lot and Stores dock area are concrete and/or asphalt. The ground level beneath the boiler structure and main baghouse is concrete. The remaining areas in-and-around the Maintenance Shop, boiler structure, and Administration Building are covered with heavy gravel.

ZMW/dustcp
attachment
File 40.5.4.5.3
cc: R. Melvin w/o
S. Munro (CEC MS-2000) w/
F. Perkins (McLaughlin) w/
D. Righthouse w/
Z. Waller w/

The private road network to the north of the main asphalt road is unpaved. However, use of these roads by vehicles is minimal since access to the cooling tower is within walking distance.

The ash disposal site is located on terrain with a 2% grade. The private road network to, and around, the site is unpaved. However, the road is not heavily traveled; an average of four (4) truck loads of ash are discharged at the site per day.

D. Type of Activity

Activity at the ash site consists of non-hazardous ash being loaded from the boiler facility ash storage silos into fully enclosed and contained hopper-trailers. An average of four truck loads per day are driven approximately one-half mile north to the ash site. Once there, the hoppers are connected to a piping system where the ash is pneumatically blown into a mixing "T" and commingled with brackish water. From the mixing "T" the mixture is discharged in a slurry form into an excavated cell. Through fixation the slurry solidifies into a monolithic structure. Earth-moving activity is necessary every 4-6 months for cell development.

III. Mandatory Actions List

A. Provision to Maintain Natural Topography

Natural topography will be maintained to the maximum extent feasible during earth-moving activities. Grading Plans approved by the San Bernardino County Office of Building and Safety will be followed during construction activities.

B. Construction Schedule

Construction or earth-moving activities will occur in phases per the specific job. Earth-moving activities will occur only when that phase of construction is required, i.e., vegetation will remain in place and undisturbed until such time as earth-moving is necessary. Revegetation of disturbed surface areas will occur as soon as practicable to approximate natural conditions.

Ample parking space and paved roads exist within the facility grounds to accommodate construction equipment. However, any

future project(s) will be planned to first evaluate the need for additional parking lots or paved roads, to construct any new parking lots or paved roads first, and to construct upwind structural components of a project prior to downwind structural components.

C. Provision to Cover/Contain Bulk Material

Excavated bulk material, from major construction projects, and stockpiled for backfilling will be sprayed with water to form a sealant crust, or otherwise contained, to minimize fugitive dust emissions.

Bulk material generated by construction or earth-moving activities, and required to be hauled on paved roads within the facility, will be sprayed with water to form a sealant crust, covered, or otherwise contained on the haul truck to minimize fugitive dust emissions.

Any hauler exiting the facility with bulk material will be responsible for conformance with the requirements of Rule 403.1, the Department of Motor Vehicles, and the Interstate Commerce Commission.

D. Provision to Remove Bulk Material Tracked onto Paved Road Surfaces

Paved road surfaces within the facility will be cleaned every two weeks, or sooner as needed, to remove spilled bulk material or any accumulation of tracked-on bulk material in excess of the allowable limit.

IV. Elective Actions List

A. Other Actions Reducing Dust Emissions

Other actions that would cause the reduction of dust emissions will be considered, evaluated, and employed as warranted by the type of construction activity and ambient weather conditions. These other actions may include, but are not limited to, the following: cessation of construction activities on excessively windy days, reducing traffic speed, controlling the number of haul truck trips, increased frequency of cleaning of bulk material tracked onto paved roads, and use of a chemical dust control media on unpaved roads.

APPROXIMATE
LOCATION
OF
ASH SITE

This technical drawing shows a partial plan view of an excavation site. The site is bounded by a dashed-line outer perimeter and a solid-line inner boundary. A vertical line labeled 'C' extends from the top boundary down through the center of the site. A horizontal line labeled 'E' extends from the left boundary across the site. A small circle with the letter 'B' is located near the top center of the site. In the bottom right corner, there is handwritten text that reads 'PARTIAL PLAN'.

NAME	MONTH	CASE	DEATH	PER CENT
WYCHM-1	12/143	20120	1151	5.2
WYCHM-2	12/145	21350	1253	5.6
WYCHM-3	11/192	11050	724	11.1
WYCHM-4	11/180	11080	1120	5.0
WYCHM-5	11/180	21100	1122	5.4
WYCHM-6	11/180	21550	1124	5.3
WYCHM-7	11/170	21000	1123	3.4
WYCHM-8	11/170	21350	1123	3.3

EXISTING BUILDING AND FACILITIES LEGEND

EXISTING B	SO FIELD MANAGEMENT OFFICE
56	SEA LINE CHANNEL
57	COAL CRUSHER STRUCTURE
58	COAL RECLAM STRUCTURE
59	TEORLOGICAL
60	POTABLE WATER TANK

CONTROL MONUMENTS

NAME	NO.
MHC-B-1	62145
MHC-B-2	62145
MHC-B-3	111920
MHC-B-4	111920
MHC-B-5	111920
MHC-B-6	111920
MHC-B-7	111920
MHC-B-8	111920

LEGEND

PLANT BOUNDARY (APPROX.)	—
EASEMENT OR RIGHT-OF-WAY (APPROX.)	—
MOWN CONTROL MONUMENTS	—
PAVED ROAD	—
UNPAVED ROAD	—

TURBINE GENERATOR BUNK
 STEAM GENERATOR
 SUPPORT STRUCTURE
 FABRIC FILTER SUPPORT
 ADMINISTRATION BLDG.
 WATER TREATMENT BLDG.
 SEDIMENTATION TANKS
 TREATMENT STRUCTURE
 COAL STORAGE BARN



RELEASED FOR
CONSTRUCTION

APPROVED FOR CONSTRUCTION

GENERAL REVISIONS

North American Chemical Company D. Macauley/ EH:ed
2/5/95 cc: C. Thenacho

P.O. Box 367, Trona, California 93592-0367

January 27, 1995

15428 Civic Drive, Suite 200

Victorville, CA 92392

Dear Mr. Heaston:

In order to insure compliance with the requirements of Mojave Desert Air Quality Management District Rule 403.1 for Respirable Particulate Matter (PM10), North American Chemical Company (NACC) has established a Dust Control Plan. This plan has been developed as part of NACC's on going commitment to compliance with all District Rules and Regulations governing atmospheric emissions. The procedures of this plan will be adhered to for all applicable construction and demolition activities throughout NACC's operations in the Searles Valley.

If you have any questions regarding this matter, please contact me at (619)372-2197.

Sincerely,

Ross H. May

Ross H. May
Staff Environmental Engineer

enclosure



North American Chemical Company

P.O. Box 367, Trona, California 93592-0367

DUST CONTROL PLAN
NORTH AMERICAN CHEMICAL COMPANY

FACILITY

A. Location

1. Trona Operations
13200 Main Street
Trona, CA
2. Argus Operations
82090 First Street
Trona, CA
3. Westend Operations
80201 Trona Road
Trona, CA
4. Searles Lake Operations
Trona, California

B. Size

1. Trona Operations - Approximately 72 acres
2. Argus Operations - Approximately 90 acres
3. Westend Operations - Approximately 77 acres
4. Searles Lake Operations - Approximately 19,000 acres

C. Types of Features

1. The Trona, Argus and Westend operations are large chemical processing facilities. Within the boundaries of these operations the topography has been graded for the installation of the processing equipment, bulk shipping sites and associated administration buildings. Essentially all of the facility areas have been graded, though much of it is paved or inactive. There is potential in the future for new construction or demolition of old equipment.

2. The Lake operations are conducted on the surface of the Searles Dry Lake. The disturbed areas are access roads, well drilling sites and evaporation ponds. Future disturbed areas will mainly be new access roads, well locations and pipeline construction. The majority of the surface is undisturbed.

D. Type of Activity

1. The Trona, Argus and Westend plants are inorganic chemical production facilities, producing sodium, potassium and boron compounds. Each location is comprised of an array of processing equipment used to separate the sellable products from a mineral rich brine solution. In addition to the production equipment there are associated bulk rail and truck loading operations, as well as administrative buildings. In support of the production operations two coal fired boilers are located at Argus and a natural gas fired boiler and gas turbine are located at Westend. The majority of the heavy traffic areas are paved, but there are some open dirt locations that are disturbed by lighter vehicle traffic. Additional disturbances include general grading, construction and demolition.

2. Operations on the Searles Lake are to provide the mineral rich brine solution to the three production facilities. Activities are primarily road building (dirt and salt paved), excavation to support the road building, well drilling, pipeline operations, salt harvesting and vehicle traffic composed of light vehicles up to heavy machiner.

D. Bulk material tracked onto paved road surfaces will be removed by mechanical sweeping or some other reasonable means.

ELECTIVE ACTION LIST

The following activities have also been implemented and will continue to be implemented as necessary to control PM₁₀ per District Rule 403.1:

A. Mechanically sweep heavily traveled paved roads in the Trona, Argus and Westend facilities a minimum of every other week (except for periods of rain).

B. Salt pave a minimum of eight miles of road on Searles Lake for the purpose of reducing vehicle generated fugitive dust.

C. Water unsalted roads on Searles Lake weekly. The amount of unpaved road watering required is determined by the number of miles that have been salt paved subtracted from 20. Example: If eight miles have been salt paved, then 12 miles of dirt road require weekly watering. If 12 miles of road have been salt paved, then eight miles of dirt road require weekly watering.

D. Permanently eliminate a minimum of 2750 square feet of bulk material pile surface area that was exposed as of 1990.

MANDATORY ACTIONS LIST

Based on the requirements of District Rule 403.1, North American Chemical Company has implemented and will continue to implement the following procedures for control of respirable particulate matter (PM₁₀) during construction and demolition activities:

- A. During grading and other earth movement activities, the natural topography will be maintained to the extent possible.
- B. When applicable, schedules that specify construction of parking lots and paved roads first and upwind structures prior to downwind structures will be established.
- C. Bulk material in haul trucks operating on paved (public) roads will be covered or otherwise contained.



DEPARTMENT OF THE NAVY
NAVAL AIR WEAPONS STATION
CHINA LAKE, CALIFORNIA 93555-6001

IN REPLY REFER TO:

5090
Ser 823E00DC(C8305)/692
6 Jun 95

Mr. Eldon Heaston
Mojave Desert Air Quality Management District
15428 Civic Drive, Suite 200
Victorville, CA 92392-2383

Dear Mr. Heaston:

I am sending this letter in response to your letter of December 19, 1994, which provided guidance for the submission or re-submission of Dust Control Plans (DCPs) as required by District Rule 403.1.

The proposed DCP for the San Bernardino County portion of our installation is provided as enclosure (1). This plan includes a list of dust abatement procedures which will be used (as applicable) at all construction/demolition sites at China Lake, whether the work is being performed under contract or by in-house personnel. Rather than submit a separate DCP for each instance of construction/demolition at this installation, we request that the enclosed plan be approved by the District as the DCP for any construction/demolition activities that we may undertake within your jurisdiction.

I appreciate your provision of additional guidance in this matter, and look forward to hearing from your office in due course. Please direct any questions you may have to Brenda Mohn at (619) 927-1513.

Sincerely,

CAROLYN A. SHEPHERD
Head, Environmental Project Office
Public Works Department
By direction of the Commanding Officer

Enclosure:

(1) Dust Control Plan for Naval Air Weapons Station, China Lake

RECORDED
11/1/95

13 JUN - 9 AM 11:48

DUST CONTROL PLAN
Naval Air Weapons Station
China Lake

Affected Facility:

The Naval Air Weapons Station (NAWS), China Lake, is located adjacent to the City of Ridgecrest, about 120 miles north of Los Angeles. NAWS China Lake is one of four sites comprising the Naval Air Warfare Center Weapons Division (NAWCWPNS). The other sites are located in Point Mugu, California, and Albuquerque and White Sands, New Mexico. The mission of NAWCWPNS is to be the Navy's full-spectrum research, development, test, evaluation, and in-service engineering center for weapon systems associated with air warfare (except antisubmarine warfare systems), missiles and missile subsystems, aircraft weapons integration, and assigned airborne electronic warfare systems, and to maintain and operate the air, land, and sea ranges of the Naval Western Test Range Complex.

NAWS China Lake includes a vast complex of laboratories and test-range facilities that support the NAWCWPNS mission. It covers more than 1.1 million acres of land, including portions of Kern, Inyo, and San Bernardino Counties (412,463 acres), making it the Navy's largest land activity. The mission of NAWS China Lake is to operate and maintain base facilities and provide base support services, including airfields, for the NAWCWPNS organization at China Lake, assigned tenants and activities, and transient units.

This Dust Control Plan (DCP) applies only to those portions of NAWS China Lake which lie within the jurisdiction of the Mojave Desert Air Quality Management District (Figure 1).

Mandatory Actions:

The area included in this DCP contains both disturbed and undisturbed land. Construction and/or demolition is occasionally performed at various locations throughout the installation in order to improve utilities, upgrade facilities, or accommodate changing programs and/or technologies. Most of these actions are quite small in nature (e.g., pouring a small concrete pad on which to site a camera mount). Large construction projects are less frequent, as they must receive Congressional approval through the Military Construction program.

NAWS China Lake has developed a list of standard dust abatement measures which will be implemented at all construction/demolition sites at the installation, whether the work is being performed under contract or by in-house personnel (Attachment A). These measures are included as conditions of all documentation prepared under the National Environmental Policy Act (NEPA) as part of the process of approving construction and demolition projects. Compliance with all environmental laws and regulations (which would include MDAQMD Rule 403.1) is a requirement of all construction contracts procured by NAWS China Lake.

Requirements for Dust Control at Construction and Demolition Sites

The proponent¹ shall take reasonable precautions to prevent visible particulate matter from being airborne from the construction site, under normal wind conditions. Reasonable precautions may include, but are not limited to:

1. The proponent shall have available a minimum of one watering truck to apply water to the haul roads and construction areas. Water will be applied to these areas in the amount (and at the frequency) necessary to prevent the site from becoming a source of fugitive dust. Rainfall may be considered an "application" of water if there was enough of it to prevent the site from becoming a source of fugitive dust.
2. The proponent shall post and observe a speed limit of 25 mph at the project site. (This means the actual construction site and any unpaved access to the site. It does not include paved roads in the vicinity of the project site.) During normal daily activity the speed limit will be strictly enforced by the proponent.
3. Water or other dust suppressants shall be used to prevent particulate matter from becoming airborne in handling dusty materials to open stockpiles and mobile equipment. All stockpiles of topsoil, sand, and other like materials shall be covered to prevent airborne fugitive dust.
4. The proponent shall be responsible for removing (at least once per week during construction) materials tracked onto paved roadways by construction vehicles associated with the project.
5. All bulk materials being hauled on paved roadways shall be covered during transit.
6. Earth movement shall be limited to the minimum required to achieve project objectives.

¹For the purposes of this list of requirements, the word "proponent" means the person or group undertaking the construction or demolition activities in question, whether this is an outside contractor or China Lake personnel.

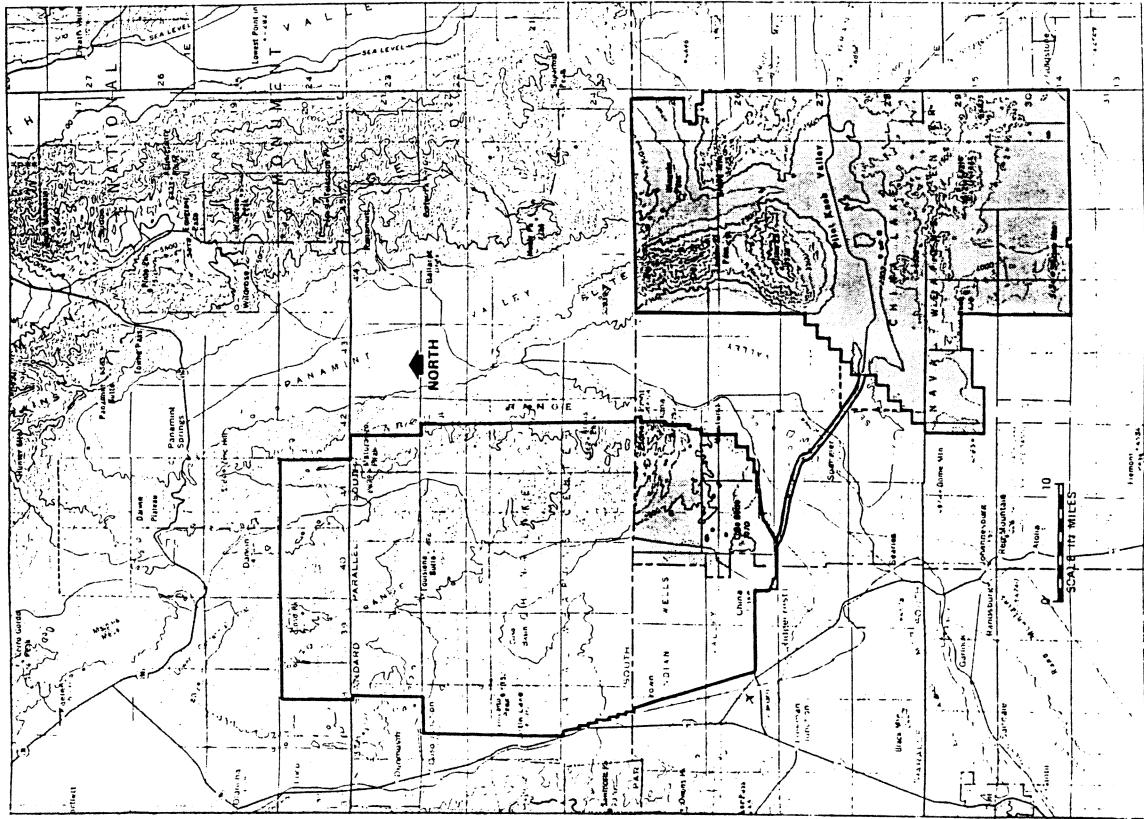


Figure 1: MDAQMD portions of NAWF China Lake



United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Ridgecrest Resource Area
300 South Richmond Road
Ridgecrest, California 93555-4436

- TAKE
PRIDE
IN
AMERICA
IN REPLY REFER TO:
3. We also plan a number of future projects which will reduce PM-10 emissions. Our plans include additional dust control measures at our wild horse and burro corrals, sealing access roads, and staging areas associated with OHV use, and a signing and education program aimed at OHV users.

3. We also plan a number of future projects which will reduce PM-10 emissions. Our plans include additional dust control measures at our wild horse and burro corrals, sealing access roads, and staging areas associated with OHV use, and a signing and education program aimed at OHV users.
- We feel that the actions we have already taken or are about to take will achieve the 20% reductions required by the SIP by December 30, 1994. We plan to continue to incorporate PM-10 emission control features into our future actions to continue to reduce those emissions. We also expect to use the conformity process to control emissions.

Chuck Fryxell, Air Pollution Control Officer
Mojave Desert Air Quality Management District
15428 Civic Drive, Suite 200
Victorville, CA 92392-2383

Dear, Mr Fryxell:

Over the past year or so Glenn Harris, Natural Resource Specialist, of my staff and your staff have been working on air quality issues affecting the region. Of major emphasis has been the Seales Valley PM-10 non-attainment area. Some of these issues included development of the SIP, rule making, conformity and actions BLM would take to implement the SIP.

I thought it would be appropriate at this time to summarize our plans. As you know, we worked with your staff in developing control strategies that were incorporated into the SIP and subsequent rule making. It is our intent to carry out the intent of those rules in the following manner:

1. We intend to develop an MOU with the Mojave Desert Air Quality Management District that will spell out the details of a BLM PM-10 control plan, enforcement, conformity, cooperation and other such issues.
 - a reduction in the number of OHV (Off Highway Vehicle) competitive events from the 26 that occurred in 1990 (the base line year) to a planned 14 in FY 1995.
 - Closing some OHV routes and rehabilitating them.
 - Closing some OHV staging areas and rehabilitating them.
 - Redoing water control structures around our wild horse and burro corrals on Highway 178 to direct flood water and silt away from the highway.
 - We have been requiring RACM as applicable on all authorizations we issue for the use of the public lands.
 - We consult with the MDAQMD on necessary mitigation of proposals we think may be an air quality problem.
2. While the details of the MOU are being worked out, we have started carrying out the actions our staffs have agreed upon. These include:
 - a reduction in the number of OHV (Off Highway Vehicle) competitive events from the 26 that occurred in 1990 (the base line year) to a planned 14 in FY 1995.
 - Closing some OHV routes and rehabilitating them.
 - Closing some OHV staging areas and rehabilitating them.
 - Redoing water control structures around our wild horse and burro corrals on Highway 178 to direct flood water and silt away from the highway.
 - We have been requiring RACM as applicable on all authorizations we issue for the use of the public lands.
 - We consult with the MDAQMD on necessary mitigation of proposals we think may be an air quality problem.

If you have any questions, feel free to contact Glenn Harris of my staff.

Sincerely,

Lee Delaney
Area Manager

OCT 6 1994
RECEIVED
U.S. POSTAL SERVICE
OCT 11 1994
FBI - LOS ANGELES
SEARCHED INDEXED SERIALIZED FILED

(CA-065.31)

NORTH AMERICAN CHEMICAL COMPANY
STREET SWEEPING LOG

Date: 7/24/94 7/25/94
Driver: John D. Johnson
Contractor: Contractors Cleaning

TRONA	ARGUS
<u>10</u>	<u>3</u>
<u>4</u>	<u>1</u>
<u>20</u>	<u>10</u>

WESTEND

No. of loads	Volume per load (cubic yards)	Miles swept
<u>24</u>	<u>5</u>	<u>5</u>

Comments:

Estimated weight of material removed by sweeping based on an average weight of 55 lb/ft³.

$$\text{Trona: } (55 \text{ lb/ft}^3) \times (27 \text{ ft}^3/\text{yd}^3) \times (4 \text{ yd}^3/\text{load}) \times (10 \text{ loads}) \\ = \underline{59,400} \text{ pounds}$$

$$\text{Argus: } (55 \text{ lb/ft}^3) \times (27 \text{ ft}^3/\text{yd}^3) \times (4 \text{ yd}^3/\text{load}) \times (3 \text{ loads}) \\ = \underline{17,820} \text{ pounds}$$

$$\text{Westend: } (55 \text{ lb/ft}^3) \times (27 \text{ ft}^3/\text{yd}^3) \times (4 \text{ yd}^3/\text{load}) \times (24 \text{ loads}) \\ = \underline{142,560} \text{ pounds}$$

$$\text{Total: } 219,780 \text{ pounds} \\ = 110 \text{ tons}$$

NORTH AMERICAN CHEMICAL COMPANY
STREET SWEEPING LOG

Date: 7/31 + 8/1/94
Driver: John D. Johnson
Contractor: Contractors Cleaning

TRONA	ARGUS
<u>12</u>	<u>4</u>
<u>48</u>	<u>16</u>
<u>20</u>	<u>10</u>

WESTEND

No. of loads	Volume per load (cubic yards)	Miles swept
<u>14</u>	<u>5</u>	<u>5</u>

Comments:

Estimated weight of material removed by sweeping based on an average weight of 55 lb/ft³.

$$\text{Trona: } (55 \text{ lb/ft}^3) \times (27 \text{ ft}^3/\text{yd}^3) \times (4 \text{ yd}^3/\text{load}) \times (12 \text{ loads}) \\ = \underline{71,280} \text{ pounds}$$

$$\text{Argus: } (55 \text{ lb/ft}^3) \times (27 \text{ ft}^3/\text{yd}^3) \times (4 \text{ yd}^3/\text{load}) \times (4 \text{ loads}) \\ = \underline{23,760} \text{ pounds}$$

$$\text{Westend: } (55 \text{ lb/ft}^3) \times (27 \text{ ft}^3/\text{yd}^3) \times (4 \text{ yd}^3/\text{load}) \times (14 \text{ loads}) \\ = \underline{83,160} \text{ pounds}$$

$$\text{Total: } 178,200 \text{ lbs} \\ = 89 \text{ tons}$$

NORTH AMERICAN CHEMICAL COMPANY
STREET SWEEPING LOG

Date: 10-21-22
Driver: KOOGAN
Contractor: KOOGAN Sweeping

TRONA	ARGUS	WESTEND
<u>10</u>	<u>10</u>	<u>11</u>
<u>5</u>	<u>5</u>	<u>5</u>
<u>25</u>	<u>20</u>	<u>15</u>

Comments:

Estimated weight of material removed by sweeping based on an average weight of 55 lb/ft³.
Trona: $(55 \text{ lb/ft}^3) \times (27 \text{ ft}^3/\text{yd}^3) \times (5 \text{ yd}^3/\text{load}) \times (16 \text{ loads}) = 117,600 \text{ pounds}$
Argus: $(55 \text{ lb/ft}^3) \times (27 \text{ ft}^3/\text{yd}^3) \times (5 \text{ yd}^3/\text{load}) \times (10 \text{ loads}) = 114,250 \text{ pounds}$
Westend: $(55 \text{ lb/ft}^3) \times (27 \text{ ft}^3/\text{yd}^3) \times (5 \text{ yd}^3/\text{load}) \times (11 \text{ loads}) = 116,750 \text{ pounds}$

Estimated weight of material removed by sweeping based on an average weight of 55 lb/ft³.
Trona: $(55 \text{ lb/ft}^3) \times (27 \text{ ft}^3/\text{yd}^3) \times (5 \text{ yd}^3/\text{load}) \times (17 \text{ loads}) = 126,225 \text{ pounds}$
Argus: $(55 \text{ lb/ft}^3) \times (27 \text{ ft}^3/\text{yd}^3) \times (5 \text{ yd}^3/\text{load}) \times (4 \text{ loads}) = 27,700 \text{ pounds}$
Westend: $(55 \text{ lb/ft}^3) \times (27 \text{ ft}^3/\text{yd}^3) \times (5 \text{ yd}^3/\text{load}) \times (16 \text{ loads}) = 118,000 \text{ pounds}$

Total = 274,725 lbs
= 137 tons

RECEIVED
MDAQMD

SGTFC -4 PH 4:00



November 30, 1995

Alan DeSalvio
Air Quality Specialist
Mojave Desert AQMD
15428 Civic Drive, Suite 200
Victorville, CA 92392

RE: Dust Control Plan - Ash Cleanup Log

Dear Alan:

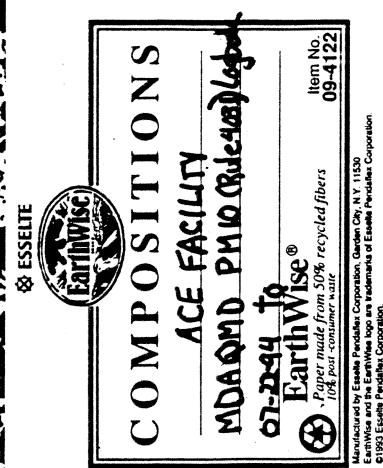
Per your telephone request on November 17, 1995, attached is a copy of A/C Power - ACE Operations' ash cleanup log as of November 24, 1995. For your information, the paved area around the fly ash and bottom ash storage silos is swept up every 1 to 2 weeks, or sooner as needed.

If you have any questions please call me at (619)372-2113, Ext. 115.

Sincerely,

Z. M. Waller
EH&S Manager

ZMW/dustcp
attachment
File 40.5.4.5.3



A/C Power - Ace Operations' Ash Cleanup Log

DATE:	LOCATION:	lbs	
7/23/94	F/A Silos unloading truck, Ash	FAE	
7/23/94	B/A Silos unloading truck, Ash	FAE	
7/23/94			
7/27	F/A Silos	17 LBS	TLE
7/27	B/A Silos	55 LBS	TLE
8/1/94	F/A Silos	150 lbs	FAE
8/5/94	F/A Silos cleanup	125 lbs	FAE
8-9-94	F/A Silos	20	SM
8/12/94	F/A hopper pad, FA, BA, truck unloading	25 lbs	L.R.
8/19/94	F/A Silos. Three unloading sites	5 LBS	FAE
8/19/94	F/A Silos. Three unloading sites	20 LBS	FAE
8/21/94	F/A - BA Silos	23 LBS	FAE
9-3-94	F/A & BA	2	DR
9-2-94	F, boric Filter by house	30	DR
9-7-94	FA & BA loading Area	150	DR
9-16-94	FA & BA Silos. Truck unloading	15 LBS	FAE
9/23/94	FA & BA Silos. Truck unloading	5 LBS	TLE
9/25/94	FA - SPILL	360 LBS	TLE
9/26/94	FA & BA Silos Spill	350 LBS	FAE
9/26/94	FA	30	DR
9/26/94	FA & BA	18 LBS	TLE
9/28/94	FA & BA	69 LBS	TLE

DATE:	LOCATION:	lbs	
10/26/94	FA & BA - General cleanup	42# 3/402	SM
10/28/94	FA & BA	100#	DR
11/4/94	FA & BA General cleanup	30"	FAE
11/18/94	FA & BA	28#	TLE
11/20/94	FA & BA	5 Lbs 802.	DR
12/9/94	FA & BA Clean up	10 lbs.	FAE
12.19.94	F A & BA Clean up	20	DR
12-23-94	FA & BA & FE + SP. II	250 lbs	DR
1-6-95	FA & BA General cleanup	30 lbs	FAE
1-13-95	FA & BA Clean up	EA 14.5 BA	TLE
1-20-95	FA. Silo unloading area	20 lbs.	SM
1-25-95	F.A. Silo Spill	1000 lbs	DR
2-3-95	FA @ IRA Silo cleanup	30 lbs	FAE
2-10-95	Fly Ash	190 LBS	TLE
2/17/95	6.0.1 Clean	DR	DR
2/24/95	Fly ash area	12 lbs	DR
3/3/95	Fly Ash + BA clean up	20 lbs	FAE
3/18/95	Fly Ash + BA Cleaning	523 lbs	TLE
3/17/95	Fly Ash Area	40#	SM
4/2/95	Fly Ash Area	25#	FAE
5-5-95	FA & BA LOADOUTS	35 lbs	SM
5-12-95	FA & BA load out	200 lbs	DR
5-26-95	FA & BA clean up	35 lbs	FAE
6-2-95	FA & BA Clean up	5828 FA (31 LBS)	TLE

A/C Power - Ace Operations' Ash Cleanup Log

(* start of sequence)

Date	Location	lbs	Sign	Location	lbs	Sign
6-9-95	FA & BA Ash	20 lbs	DY	113 lbs	FA & BA	150 lbs 2 nd
6-23-95	FA @ BA Ash	40 lbs	DK	11/9/95	FA + BA	100 lbs
6/30/95	FA @ BA Ash	520 lbs	TLF	11-11-95	FA + BA	150 lbs 2 nd
7/14/95	FA & BA	20 lbs/10 lbs	CR	11-17-95	FA : BA	150 lbs 3 rd
7-19-95	FA & BA	40 lbs	DY	11-34-95	FA : BA	300 lbs
7-21-95	FA & BA	30 lbs	DK			
7-28-95	FA & BA	40 lbs	DK			
8-4-95	FA & BA	250 lbs	DK/BL			
8/18/95	FA + BA cleanup	518 lbs	DA FA			
8/25/95	FA + BA	12 lbs	DA			
9-1-95	FA & BA	15 lbs	DP			
9-15-95	FA & BA	200 lbs	DA			
9-8-95	FA & BA	20 lbs	DA BL			
9-22-95	FA & BA	5#	DA			
9-29-95	FA & BA	75 lbs	DP			
10-5-95	FA = 26" H	350 lbs	DP			
10/6/95	BA cleanup up	16 lbs 3.3 ozs	LR			
10/13/95	BA SPILL	50 lbs	DK			
10/16/95	BA S.10 i FA	200 lbs	DK			
10-16-95	BA S.10 i FA	210 lbs	DK			
10-20-95	BA : FA S10	350 lbs	DK			
10-28-95	BA - FA	20 lbs	DK			
10-28-95	BA & FA	250 lbs	SM			

Report on Chemical Stabilization in the San Bernardino County Portion of the Searles Valley Planning Area

Background

The Searles Valley PM₁₀ Plan or ‘Plan’ (last amended on June 28, 1995) included a requirement for ‘Stabilization of Public Disturbed Areas.’ The Plan defined this requirement as ‘at least 69 acres of disturbed open areas shall be treated at a 90% control level.’ The Mojave Desert Air Quality Management District (MDAQMD) included this treatment or stabilization as a funding item in its 1994-1995 105 grant request. ‘Searles Valley Disturbed Area Stabilization’ was funded as Task I in the MDAQMD 1994-1995 grant, for a total of \$15,000.

RFP, Proposal and Contract

MDAQMD circulated a Request for Proposals (RFP) on August 23, 1995 to ten prospective chemical stabilization contractors. The RFP specified a list of nine areas for treatment, and asked for proposals totaling no more than \$15,000 to treat the maximum number of those areas. The RFP also specified a 90 percent control efficiency for twelve months as a performance standard.

MDAQMD received four proposals in response to the RFP, and selected Midwest Industrial Supply, Inc. and Soil-Sement as the contractor. This decision was based on performance of the proposed stabilizer compound and amount of area proposed to be treated.

A contract between MDAQMD and Midwest Industrial Supply was drafted and signed on September 25, 1995. The contract called for treatment of four areas with 5,070 gallons of “Soil-Sement” for a total cost of \$12,268.

Treatment

The Soil-Sement was applied on September 30, 1995 to four parking and vehicle staging areas around the Trona School District facilities. School parking areas on both sides of Trona Road, the Trona School District Maintenance Yard, and Trona School District Maintenance parking area were all treated. The extent of the area treated has not been accurately measured, but MDAQMD staff estimate it to be approximately five acres.

Saturday, September 30th was chosen for the application due to the nature of the sites treated. The Trona School District was very cooperative in the process, and agreed to close the treated areas for the weekend to allow curing time. A negative associated with Soil-Sement is a disagreeable odor on application (described as a ‘garbage’ smell by school district staff). This odor was barely discernible on October 20th when MDAQMD reviewed the treated sites.

Photographs of the treated areas are attached. These photographs were taken by MDAQMD staff on October 20, 1995. Note the slight 'gray' discoloration of the treated areas.

Effects of Treatment

Treatment with Soil-Sement resulted in a hard surface, similar in look and feel to gray asphalt. No loose material remained in treated areas, except where large rocks have broken free. The treatment reached a depth of two to three inches. Treated areas are meeting the performance standard of at least 90 percent emission reductions under slow passenger vehicles (parking activity). Relation of treated area reductions to attainment plan reduction requirements is difficult. However, treated areas represent the most heavily used 'public disturbed areas' in the San Bernardino County portion of the Searles Valley Planning Area outside of actual unpaved roads.

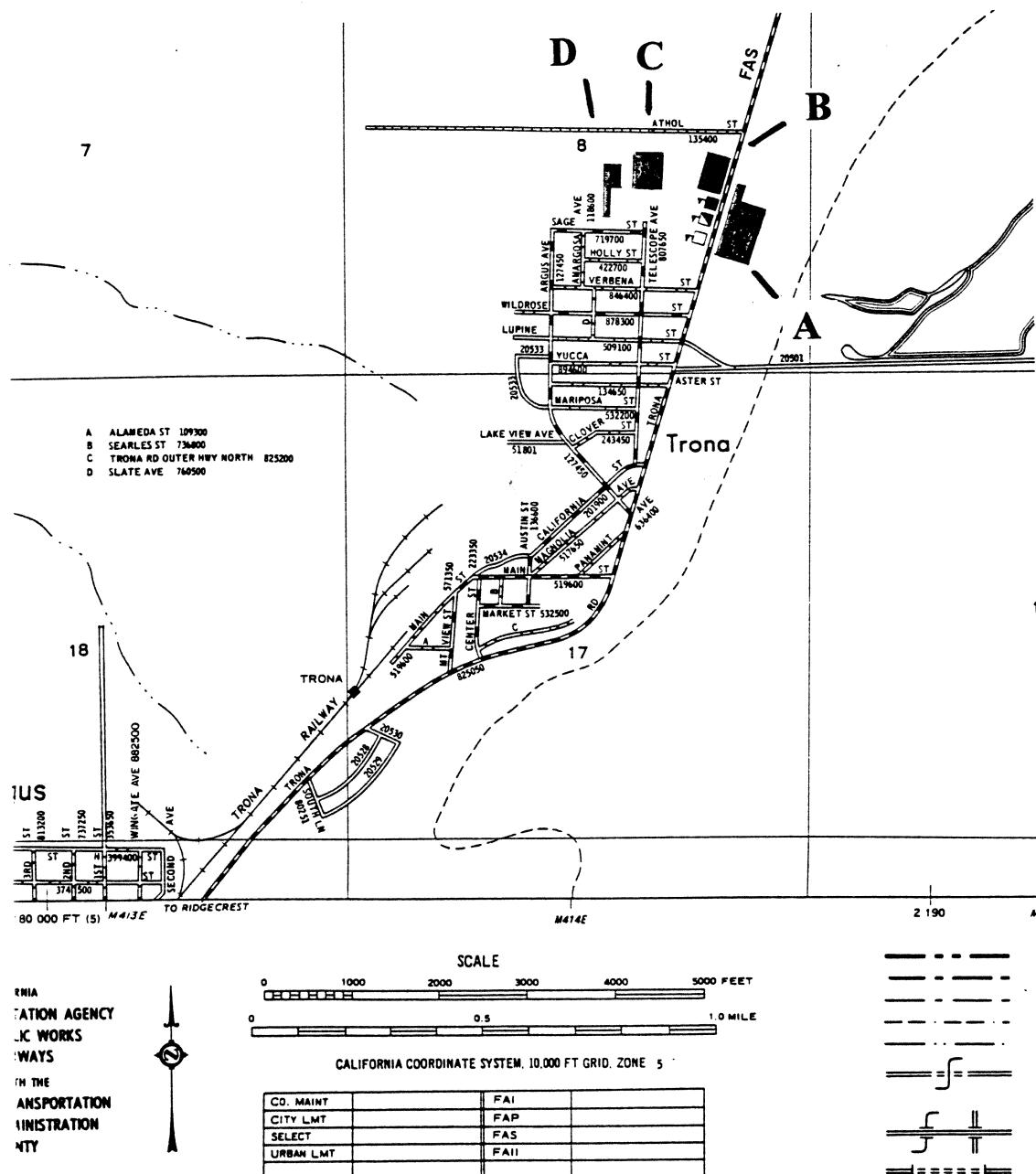
Assuming each acre produces 1,176 pounds of PM₁₀ per year, treatment project will generate at least 5,292 pounds or 2.65 tons of annual PM₁₀ reductions.

Follow Up

MDAQMD staff will monitor treated areas on a quarterly basis to evaluate persistence of treatment, and resilience of treatment to a variety of weather conditions (including high winds and rainfall).

Map of Treated Areas

- A. School parking on east side of Trona Road
- B. School (Gymnasium) parking on west side of Trona Road
- C. Trona School District Maintenance Yard
- D. Trona School District Maintenance parking and staging



1. View north along Trona Road of Area 'A'



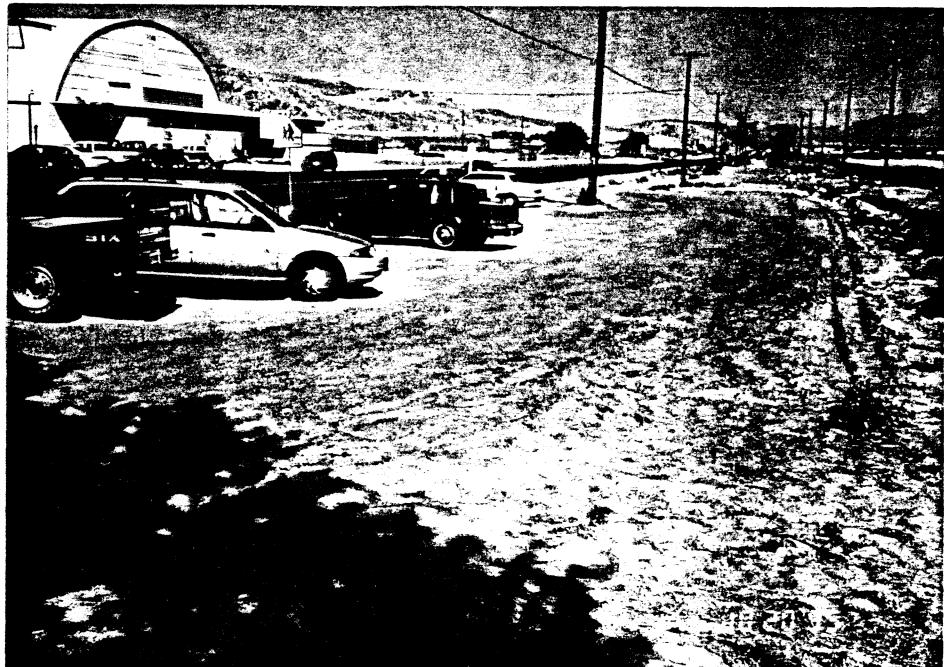
2. View northwest from southeastern corner of Area 'A'



3. View northeast from Trona Road of northern end of Area 'A'



4. View northwest of
northern end of Area 'A'



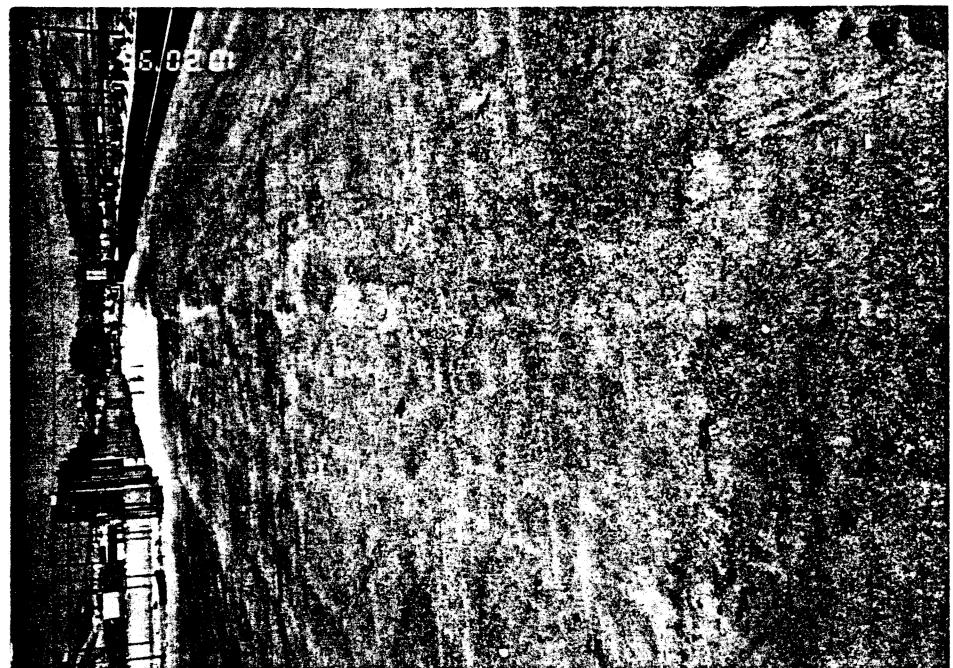
5. View northeast from
southwestern corner of
Area 'B'



6. View northwest from
southeastern corner of
Area 'B'



7. View north of seam
between Area 'B' and
actual aged asphalt



8. View north from
southeastern corner of
Area 'C'

